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SEPARATED RIGHTS IN REAL ESTATE

Richard R. Almy
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1982

U.S. Department of Agriculture
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Natural Resource Economics Division

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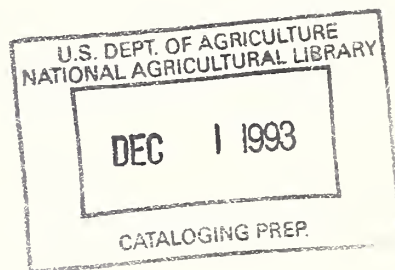


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ABSTRACT

Growing population and growing demand for land and related natural resources have resulted in an increasingly complex real property system. This report considers four kinds of separated rights: air, mineral, water, and transferrable development. In particular, the ways these rights are created, transferred, recorded, and valued (assessed) are examined. This report is part of a larger study in the Economic Research Service on the status and consequences of the structure of landownership in rural America.

Key words: Landownership, separated rights, mineral rights, air rights, water rights, transferrable development rights, valuation, taxation, rights transfers, rights recording.

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PREFACE

Nominal ownership, shown as the title holder of the surface rights of land, reveals only part of the real property picture. Rights and obligations may be divided in many ways with many consequences. This report provides an overall assessment of an important set of these separated rights. As such, this report is a helpful qualifier to the question of and answer to, "Who Owns the Land?"

Under pressure from increasing demands from a growing population land is divided not only into smaller surface units but is shared for shorter periods of time, for concurrent multiple uses, and at different levels above and below the surface. The result is increasing complexity of rights which would occur even if many forms of public interest were not represented in the rules for creating, recording, and trading land rights. The complexity of these separated, refined rights ultimately appears in the overhead cost of the real property system.

This report is part of a larger study in the Economic Research Service of the structure and consequences of rural landownership in the United States. While the larger study is directed primarily at general qualities of nominal ownership, this phase of the study examines the rights that can be, and are, separately identified, priced and exchanged.

1. INTRODUCTION

This paper explores separately-owned air and subsurface rights, mineral and underground water rights, and development rights. It treats the creation, transfer, recording, and valuation of these separated or attenuated rights in real estate. It is hoped that the discussion will contribute to a better understanding of the nature of interests in real estate in the United States and, in turn, to better solutions to the nation's land-information needs and to more refined land markets.

1.1 FUNDAMENTAL CONCEPTS

In order to establish a context for the ensuing discussion of separated rights in real estate, we will briefly review certain fundamental concepts and define some terms that have different common and legal meanings.

Of paramount importance is the legal concept of "property." Property consists of legal relations among people in regard to a thing.^{1/} Property consists of numerous legally recognized rights to possess, use, enjoy, and dispose of a thing, or to put it still another way, without laws, property ceases.^{2/} The legal nature of property manifests itself not only in the legal principles that underly laws and cases, but also in the record systems that contain information about properties and their owners, subjects that we shall discuss in more detail later.

The things to which property rights are attached can be classified as "real" or "personal," hence the terms "real property" and "personal property." Thus, real property is the rights, interests, and benefits inherent in the ownership of "real estate," which is the physical parcel of land, improvements to the parcel (e.g., clearing and grading), improvements attached to the

^{1/} John E. Cribbet, Principles of the Law of Property, 2nd ed., University Textbook Series (Mineola, New York: The Foundation Press, Inc. 1975), p. 2.

^{2/} Ibid., p. 2.

parcel (e.g., buildings), and appurtenances (e.g., easements that cross the parcel or give access to the parcel). Personal property, although not of major concern in this paper, is defined by exception: property that is not "real" is "personal." (The salient characteristic of personal property is its movability without damage either to itself or to the real estate to which it is attached or on which it is located.)

A parcel of land, in turn, is defined as:

...a contiguous area of land described in a single description in a deed or as one of a number of lots on a plat; separately owned, either publicly or privately; and capable of being separated conveyed.^{3/}

In geographic terms, a parcel is regarded as potentially extending from the center of the earth upwards to the periphery of the universe in the form of an inverted pyramid circumscribed by the boundary of the parcel. Thus, property rights extend both above and below the surface of the earth, although there are obvious practical limits to the use of air and sub-surface space. The advent of air travel (and perhaps later, space travel) has made it necessary to deny land owners the power to exclude use by others of upper air space. In other words, air has become a public highway. On the other hand, low-flying aircraft can invade a landowner's dominion and damage his or her property. Thus, a landowner's actual rights to the space above or below the surface of the earth are somewhat indefinite and depend to some extent on his or her ability to use the space. Location also defines certain rights; persons owning land in a landing approach path to an airport have generally had to surrender their air rights above a certain height to a public authority.

To sum up, each property right can be visualized as a stick, and the complete bundle of sticks that represents the full quantum of rights possible is conceived as a "bundle of rights." Ownership of the complete bundle of rights, subject to rights reserved by the state (e.g., taxation, eminent domain, police power, and escheat) is known as "fee simple absolute," a term that is often shortened to "fee simple" or "the fee." However, ownership or possession of the bundle of rights can be, and quite commonly is, divided or shared. Numerous divisions or sharings are possible. For example, easements, leases, and mortgages are common examples of cases in which bundles are separated.

3/ D. David Moyer and Kenneth Paul Fisher, Land Parcel Identifiers for Information Systems (Chicago: American Bar Foundation, 1973), p. 3.

1.2 SCOPE OF STUDY

This study focuses on separated rights that can be purchased or sold outright and hence would involve the recording of conveyance documents and might involve separate assessment. Specifically, we will consider: (1) air and subsurface space rights; (2) mineral rights; (3) underground water rights; and (4) development rights.

In effect the conveyance of air and subsurface space rights truncates the inverted pyramid represented by a parcel or otherwise "slices" it into separately owned segments. The separate ownership of airspace normally occurs over railroad and highway rights of way in densely developed urban areas where land values are high. The extent of developments in separately-owned air and subsurface space is not well documented. A 1968 status report by the Federal Highway Administration on highway joint development and multiple use identified approximately 700 projects, proposals, and studies in the United States.^{4/} A contemporary survey by the National League of Cities identified a total of 281 existing or planned air space projects over both public and private land.^{5/} In contrast, the 1973 report, Valuation of Air Space, by Daniel, Mann, Johnson, and Mendenhall for the Highway Research Board identified only nine instances of private developments and thirteen major public buildings involving highway air rights that actually were in existence or were under construction. There are, of course, a somewhat larger number of developments involving railroad air rights. Appendix A contains a list of the more significant air rights developments, notable examples of which include the George Washington Bridge Apartments in New York City, the development along Park Avenue in New York City, Penn Center in Philadelphia, and developments over the tracks of the Illinois Central Gulf Railroad in Chicago.^{6/} Such airspace developments tend to be

^{4/} U.S. Department of Transportation, Bureau of Public Roads, Highway Joint Development and Multiple Use (Washington, D.C.: U.S. Government Printing Office, 1970), cited by Daniel, Mann, Johnson, and Mendenhall, Valuation of Air Space, National Cooperative Highway Research Program Report No. 142 (Washington, D.C.: Highway Research Board, 1973), p. 13.

^{5/} National League of Cities, Department of Urban Studies, Air Space Utilization (Washington, 1968), p. 6.

^{6/} Many air space developments do not involve the separate ownership of air rights; instead they involve leases and the granting of highway easements, which are not a subject of concern here.

singular in nature, and transfers of air rights occur rarely.

Transfers of subsurface space, excluding mineral and underground water rights, probably are rarer. Underground space is chiefly used to store oil and natural gas. In addition, there is considerable interest in other uses of underground space for human activities as an energy conservation measure. One example of the separate ownership of underground space is the Great Midwest Industrial Park in a former limestone mine under Kansas City, Missouri. There also is interest in earth-sheltered buildings. Such buildings, however, generally do not involve the separate conveyance of subsurface rights. In addition, an association, the American Underground-Space Association, has been formed to foster use of underground space.^{7/}

The purchase (and transfer) of development rights is chiefly regarded as a device for preserving agriculture, open space, or historic properties. Development rights have similarities to air rights but are more closely tied to land use controls. A development right might involve the right to change the use of the land from, say, agriculture to any other purpose, or it might involve the right to alter an existing structure. The purchase of development rights is viewed as a way of freezing existing land use patterns without raising questions about unconstitutional takings of private property without just compensation or without requiring the exercise of eminent domain. The experience to date with the purchase of development rights is limited. Suffolk County, New York, had an ambitious program of purchasing the development rights to agricultural land that was curtailed by the high cost of the development rights.^{8/} Development rights purchase programs also exist or are authorized in Connecticut, Maine, Maryland, Massachusetts, and New Jersey.^{9/} A number of communities have enacted ordinances permitting the

^{7/} Communication with Thomas C. Atchison, Executive Director, American Underground-Space Association, Suite 900 Minnesota Building, St. Paul, Minnesota 55101, 15 December 1980.

^{8/} For an analysis of this program, see William G. Leshner and Doyle A. Eiler, Farmland Preservation in an Urban Fringe Area: An Analysis of Suffolk County's Development Rights Program (Ithaca, New York: Cornell University Agricultural Experiment Station, 1977).

^{9/} Thomas J. McCord and C.L. Pfeiffenberger, State Agricultural Preservation Programs: Administration and Valuation Methodologies (Albany: New York State Division of Equalization and Assessment, 1979), p. 7.

transfer of development rights, and there have been instances of the transfer of development rights in New York City to preserve historic structures such as Grand Central Station.^{10/}

Of the types of separated interests in real estate covered in this study, mineral rights are the rights most commonly separately owned, and there is considerable experience with separately owned mineral rights in areas of active exploitation of mineral resources. These resources can be classified into three broad groups: (1) fuels (e.g., oil and natural gas, coal, uranium, and geothermal resources); (2) metals (e.g., aluminum, copper, iron, lead, etc.); and (3) non-metals (e.g., gravel, gypsum, phosphate, rock, sand, etc.). The distribution and value of these resources are suggested in appendix B. Ownership of mineral rights, however, is not well documented, although figures on the numbers of parcels or land area with separately owned mineral or the estimated value of such rights have been compiled in a number of states.^{11/}

Several types of water rights are recognized. Riparian rights, for example, are the rights of owners of riparian land (i.e., land adjacent to a natural watercourse or body of water) to make certain, restricted uses of the water while it is upon their land. Similarly, land owners may have overlying or correlative rights to underground water. The owners of such rights may not diminish either the quantity or quality of the stream or body of water upon its leaving their land, although it may be possible to impound water temporarily. These types of water rights ordinarily are not separated from the land to which they are attached. In the arid and semi-arid areas of western states, appropriative water rights may exist. Appropriative water rights recognize the scarcity of water and establish priorities or claims to available water and permit the diversion or appropriation of amounts of water from surface or subsurface watercourses for beneficial purposes (e.g., irrigation, power generation, mining, stock watering, recreation, industry, and human consumption). Appropriative water rights, which can be lost through

^{10/} There is an extensive literature on the concept of transferable development rights, some of which is listed in the bibliography.

^{11/} These states include Alaska, Arizona, Colorado, Florida, Idaho, Illinois, Kansas, Kentucky, Louisiana, Minnesota, Montana, Nebraska, Nevada, New Mexico, Ohio, South Dakota, and Utah.

non-use or abandonment, can be transferred.

As previously indicated, the forms of separated rights enumerated above will be considered in some detail. Specifically, we will consider the creation, transfer, and recording of those separated rights. We will also consider the valuation and taxation of those rights.

1.3 STUDY METHODS

This study is based on a review of relevant statutes, cases, and literature. The statutes of all fifty states were searched. The basic procedure was to consult the index and read the statutes indexed under the following headings: recordation, conveyancing, deeds, easements, air rights, mineral rights, mines and minerals, development rights, water rights, separated rights, real property, and the like. Unfortunately, the subject indexing of the state codes is not uniform (although most of the West publications appear to use the same terms), and several words and phrases commonly used in publications dealing with separated property rights are in fact not used as indexing terms in the state codes. Although we were able to locate pertinent information for most of the states (see appendix C), we must point out that some relevant statutes may have been overlooked due to these subject indexing problems. (Computer-assisted searching of state codes is available for only three states and so was not feasible for this project.)

In order to analyze case law relating to separated rights in property in the United States, we first directed our attention to digests of legal decisions, periodicals, treatises and annotated statutory laws. These sources referenced leading cases, which referenced other cases which were cited in still more cases. Research continued until we were certain that a representative sample of decisions had been consulted, all of which are cited in our Table of Cases, appendix D.

The literature consulted included treatises, journals, and government documents dealing with legal matters that impinge on separated rights in real estate, with property valuation, and with the conservation and preservation of mineral resources, open space, and landmarks. The bibliography contains references to the works that were consulted as well as other relevant works.

2. CREATION, TRANSFER, AND RECORDING OF SEPARATED RIGHTS

An analysis of reported legal case decisions indicates that separated rights can be created, transferred and recorded in a number of different ways.

2.1 CONVEYANCE OF SEPARATED RIGHTS

The method for creation of separated rights that is most often cited in the cases is the conveyance or transfer of rights voluntarily by the owner of the fee. The conveyance "separates" the rights conveyed from the bundle of rights which the fee owner holds by virtue of his fee title to property. The rights conveyed can be rights in air or subsurface space, as in Penn Central Transportation Co. v. City of New York, 438 U.S. 104 (1978); minerals, as in Rankin v. Mark, 238 Miss. 858, 120 So. 2d 435 (1960); or water rights, as in Upper Harmony Ditch Co. v. Carwin, 189 Colo. 190, 539 P.2d 1282 (1975).

2.2 RESERVATION OR EXCEPTION OF RIGHTS AND CONVEYANCE OF OTHER PROPERTY

An alternative widely recognized method for the creation of separated rights is for the fee owner of property to convey all of his rights as holder of the fee title, with the reservation or exception of certain designated rights. The rights reserved by the fee owner are the separated rights. They can be rights in air or subsurface space, as in Pearson v. Matheson, 102 S.C. 377, 86 S.E. 1063 (1915); mineral rights, as in Ledoux v. Voorhees, 222 La. 200, 62 So. 2d 273 (1952); or water rights, as in Thurston v. City of Portsmouth, 205 Va. 909, 140 S.E.2d 678 (1965).

2.3 ADVERSE POSSESSION

There is some authority for the proposition that separated rights can be created by adverse possession of those rights through a non-owner's unchallenged actual, open, notorious, and adverse use of air, water or minerals for a length of time. Broadhurst v. American Colloid Company, 85 S.D. 65, 177 N.W.2d 261 (1970). However, this does not appear to be the general rule. See 35 A.L.R.2d 124.

2.4 EMINENT DOMAIN

The cases indicate that at least some rights can be acquired from the fee owner, and thereby "separated," by eminent domain, the power of government to take private property for public use, upon payment of compensation. For example, water rights can be so acquired, as in Thurston v. City of Portsmouth, supra. In addition, the eminent domain power has been used by government to acquire air rights over property, as described in Aaron v. United States, 311 F.2d 798 (Ct. of Claims, 1963), and mineral rights, as described in Trans-Oceanic Oil Corp. v. City of Santa Barbara, 85 Cal. App. 2d 776, 194 P.2d 148 (1948). On reflection, it would seem that any of the separated rights discussed in this study could be created as separate from ownership of the fee by government purchase of those rights through eminent domain. Moreover, government can acquire other rights to property, leaving the prior fee owner with only the separate rights discussed in this study.

2.5 OTHER METHODS OF CREATION

In some instances, government merely recognizes, and thereby creates, separated rights. For example, in some states, the filing of a condominium declaration can be considered as "separating" air rights from other rights in real property because condominium units, once created, are assessed and otherwise treated separately from the land on which the condominium units are located, even though the same person may own the condominium units and the land. See Association of Owners, Satellite Apartment, Inc. v. Otte, 38 Colo. App. 12, 550 P.2d 894 (1976). In other respects, of course, it may be more logical to think of condominium ownership rights as being separated only after a condominium unit is sold to a person who does not own the subjacent land.

In the same way, when development rights are recognized by government as distinct from the land, that governmental action can also, in a sense, be considered as creating a separated right. On the other hand, the development rights might not be considered as separated until they are sold or transferred to other property. See Penn Central Transportation Co. v. City of New York, 438 U.S. 104 (1978).

Finally, there is some indication in case law that transfers through judicial and administrative action not involving eminent domain can create separated rights. See, e.g., Ames v. Ames, 43 N.E. 592 (Ill., 1896); Kanawha & Hocking Coal & Coke Co. v. Carbon County, 535 P.2d 1139 (Utah, 1975). To the contrary, see In re Delinquent Taxes, 81 Minn. 422, 84 N.W. 302 (1900).

2.6 INSTRUMENTS OF TRANSFER

Separated rights can be created by a fee owner's voluntary conveyance of such rights, using any one of several instruments. Instruments sufficient to separate rights can also be used to transfer already-separated rights, as can other instruments not used for creation of separated rights.

2.6.1 Warranty, Quitclaim, or Tax Deed

The warranty deed, by which a seller warrants his title to property sold, is one instrument used for the creation and/or transfer of separated rights. See, e.g., Humble Oil & Refining Co. v. State, 3 S.W.2d 559 (Tex. Civ. App., 1928). Alternatively, a quitclaim deed, which merely conveys the seller's interest in property, whatever that interest might be, has been used to create and/or transfer separated rights. See, e.g., Ervin v. Breese, 188 Okla. 391, 109 P.2d 507 (1940). In some states, tax deeds can create separated rights, as in Kanawha & Hocking Coal & Coke Co., *supra*. Once created, separated rights can certainly be transferred by tax deed, as in Patterson v. May, 239 Iowa 602, 29 N.W.2d 547 (1977).

2.6.2 Will or Intestate Succession

It seems clear, according to recorded cases, that a will can be an instrument for the transfer or creation of separated rights, either by conveyance of those rights, or by reservation or exception where all other rights are conveyed. See, e.g., Yoss v. Markley, 46 Ohio Abs. 217, 34 Ohio Op. 4, 68 N.E.2d 399 (1946). Apparently, however, intestate succession can operate only to transfer already-separated rights, as in Dorman v. Minnich, 336 S.W.2d 500 (Mo., 1960).

2.6.3 Other Instruments of Transfer

Separated rights are frequently leased, as in Macht v. Department of

Assessments of Baltimore City, 266 Md. 602, 296 A.2d 162 (1972). Leases are sometimes themselves assigned, as in Gillespie v. Fulton Oil & Gas Co., 236 Ill. 188, 86 N.E. 219 (1908). Additionally, separated rights are the subject of easements. See, e.g., Hartford Electric Light Co. v. Town of Wethersfield, 165 Conn. 211, 332 A.2d 83 (1973). Since leases and easements are not the chief focus of this study, however, they need not be dwelt upon in detail.

Though most authority indicates that separated rights cannot be created by adverse possession, it is clear that ownership of already-separated rights can be transferred by such possession. The generally recognized rule is that separated rights can only be transferred by adverse possession through adverse exercise of those rights. See Claybrooke v. Barnes, 180 Ark. 678, 22 S.W.2d 390 (1929). However, there is authority for the acquisition of separated rights through the general adverse possession of the land to which those rights relate. See, e.g., Jenkins v. Frederick, 208 Okla. 583, 257 P.2d 1058 (1952); Clements v. Texas Co. 273, S.W. 993 (Tex. Civ. App. 1925). In at least one state, the fee owner may be able to acquire separated rights through adverse possession simply by giving notice to the owner of the separated rights, provided no challenge to the acquisition results from that notice. See Gill v. Fletcher, 74 Ohio St. 295, 78 N.E. 433 (1906).

2.7 RECORDING OF SEPARATED RIGHTS

Generally speaking, the states have provided by law that any instrument affecting title to real estate (real estate and real property are frequently used interchangeably to mean the same thing; here, they refer to land, not improvements) may be recorded with the local recording official in the same manner as any transfer of real estate. Most of these laws are general in nature; they merely specify that any instrument (usually required to be in writing in order to be legally binding) creating or alienating real estate or interests therein or in any way affecting title to real estate must or may be recorded with the county clerk, register of deeds, or some other local official responsible for the maintenance of deeds to real estate. Recordation is usually a requirement to make the transaction legally binding on third parties. In some states, these laws specify that all real estate transfers are considered transfers of the fee simple unless the instrument of conveyance specifies

otherwise. Some conveyance and recording laws specifically include separated mineral rights as an example of an interest in real estate, and there may be specific laws that deal only with this type of interest.

Few reported cases discuss the recording of separated rights. However, some conclusions can be drawn, based upon the kinds of instruments that are used to create such rights.

2.7.1 Deeds

In jurisdictions and instances where separated rights are considered real estate, the conveyance of separated rights by deed must generally be recorded with a clerk, recorder or other official in the county or town where the interests are located, often within a certain number of days after the conveyance, in order to notify third parties. See, e.g., Hickey v. Dirks, 156 Kan. 326, 133 P.2d 107 (1943). At least in some jurisdictions, tax deeds conveying separated rights must be filed of record in a fixed period of days or be void as an instrument of title. See, e.g., Sinclair Prairie Oil Co. v. Winchester, 163 Kan. 540, 183 P.2d 947 (1947). No cases concerning recording of separated rights considered personal property have been reported, except for leasehold cases, but personal property conveyances (e.g., automobiles) in general are often recorded in central state offices rather than county offices, where personal property conveyances are recorded at all.

2.7.2 Wills

Wills must be filed with the probate court if they are to be recognized by the state. However, in most jurisdictions, wills probated and recorded by the clerk of the probate court require no further recording to notify third parties. Where further recordation is required, wills are treated in the same manner as deeds.

2.7.3 Other Instruments

Condominium declarations are frequently filed in state administrative offices, and sometimes in local offices as well. Leases and easements frequently are considered to be personal property. However, they are usually recorded in the same manner as deeds to real property. See, e.g., Yttredahl v. Federal Farm Mortgage Corporation, 104 N.W.2d 705 (N.D., 1960).

3. VALUATION OF SEPARATED RIGHTS

Without exception the valuation of separated rights in real estate is a difficult task. The task is made difficult not because of a lack of an appropriate methodology but because of limitations in available data and the singular nature of many of the properties in question. In the case of mineral rights, data limitations are associated chiefly with the fact that the nature and extent of mineral deposits (including oil and gas) cannot be directly observed, and that available data are closely guarded. In the case of air rights, subsurface rights, and development rights, data limitations are associated chiefly with a lack of market activity. Since buyers and sellers must each make evaluation decisions when agreeing upon a sale price and since other interested parties (e.g., assessors, investors, and developers) must make similar estimates of value, improvements in the accuracy and availability of data pertaining to the value of separated rights will help rationalize the markets for those rights.

The remaining sections of this chapter will consider the methods or approaches to the valuation of separated rights and the information required to make valuation decisions. Two introductory comments should be made. The purpose of an appraisal will greatly influence the amount of information contained in an appraisal document. Some appraisals are little more than informed hunches and will contain little support documentation. Appraisals made for the purposes of evaluating the feasibility of a major proposed development or of transferring such a development usually contain an extensive narrative explanation of the reasoning of the appraiser and considerable supporting documentation. Appraisals made for property tax purposes may or may not contain much supporting documentation, and all such supporting documentation is seldom assembled in a narrative report but is usually found in separate files and studies. Thus, a person reviewing an appraisal should judge it in terms of its purposes.

A review of actual appraisals or of examples in the appraisal literature will frequently be difficult to follow. In some cases the writer simply assumes that the reader possesses adequate appraisal knowledge to bridge gaps in the data or in the steps in the analysis. Other times a writer will gloss over an important step in the analysis, because the necessary supporting data were unavailable or were too difficult to obtain.

For these reasons we elected not to provide detailed examples of appraisals of separated rights; we found no examples in the literature that were sufficiently realistic and would stand alone, and we did not have the resources to develop our own realistic, detailed examples. The appraisal literature, however, does contain many examples that adequately convey the general approach in question.

3.1 FUNDAMENTAL CONCEPTS

There are two closely related concepts of property value: value in exchange and value in use. Value in exchange is the price that a property would tend to bring under specified market conditions as a result of the interplay between buyers and sellers.^{12/} This hypothetical price reflects the capacity of a property to command other goods (usually money) in exchange. Real property markets, however, are "imperfect" by the standards of market perfection in economic theory. For example, every parcel of real estate is unique at least with respect to location. There also are relatively few buyers and sellers, and market participants possess less than "full knowledge." In addition, real property markets tend to be both highly localized and segmented according to type of property. Finally, the supply of land is relatively fixed while the demand can be quite volatile. For these reasons, actual sales prices, which are historical facts, and estimates of values, which are hypothetical prices, cannot be expected to be equal. In other words, the terms price and value, as used in real property appraisal, are not synonymous (although they are frequently used as such); prices are indicators of values.

The value of real property also is often expressed as the present worth of future benefits arising from the ownership of the property. This is the basis for value in use. Under the value-in-use concept, estimates of value do not have to be based on actual sales. Instead it is necessary to make forecasts of the extent and duration of future benefits. Future benefits are related to the actual and potential uses of a property. For this reason, the concepts of use and utility are of considerable importance in real property appraisal. For example, it is customary in real property appraisal to regard money incomes from rent or the productive use of real estate as the measure

^{12/} For a particularly good discussion of appraisal fundamentals see William N. Kinnard, Income Property Valuation (Lexington, Massachusetts: D.C. Heath and Company, 1971), pp. 9-29. See also International Association of Assessing Officers, Property Assessment Valuation (Chicago: International Association of Assessing Officers, 1977), pp. 16-22.

of utility, although other measures of utility are conceivable. Residential property, for example, provides shelter and amenities, which are not often directly expressed in monetary terms. In addition, the type and intensity of use are important. In a competitive market, in which buyers and sellers are behaving rationally, the use to which a property is put will tend to be that property's highest and best use, which basically is the use that, at the time the decision is made, is expected to generate the highest rate of net return over a stipulated period of time, assuming that the use is legal and practical.^{13/} Sometimes, the interest is in the net return attributed to the site alone, and other times the interest is in the net return to the improved property, a potential source of confusion in appraisal practice.^{14/} Value in use also would be identical to value in exchange in a perfect market.

One manifestation of value in exchange is market value. Market value, which is defined in various ways, is, in essence the most probable price in terms of money that a property will bring in a competitive and open market, assuming that the buyer and seller are acting prudently and knowledgeably, allowing sufficient time for the sale, and assuming that the price is not affected by undue stimulus.^{15/} Two manifestations of value in use are "use value" and "investment value." Use value is the present worth of future benefits that can be expected from either the current use or some stipulated use such as agriculture, without regard to the benefits that might be obtained from a higher and better use. Investment value is influenced by such factors as dated and atypical lease arrangements, the ability of an investor to secure financing, and an investor's income tax situation. Since market value is the objective of most appraisals, non-market-value appraisals will not be considered further in this report. It should be noted, however, that market value, use-value, and investment value can be congruent.

^{13/} Some prefer the less idealistic concept of most probable use which is more in accord with the imperfections of real property markets.

^{14/} Halbert C. Smith and Mark R. Maurais, "Highest and Best Use in the Appraisal Profession," The Real Estate Appraisers and Analyst 46 (March-April 1980): 27-37.

^{15/} International Association of Assessing Officers, Assessment Standards Committee, Standard on Assessment-Ratio Studies (Chicago, IAAO, 1980), p. 44.

3.2 BASIC VALUATION APPROACHES

Three different "approaches to value" are traditionally used in appraisal practice. These are the sales comparison approach, the income approach, and the cost approach. There are interrelationships among these three approaches, which have led some valuation theorists to contend that there is one approach: the "market approach." Which view one holds is of little practical importance as long as it is recognized that the nature of the property being appraised and the market data that are available will make one of the three basic approaches inherently more appropriate than the others in a particular situation.

3.2.1 Sales Comparison Approach

The sales comparison approach refers to any valuation method that involves the making of comparisons between the properties being appraised, or "subject properties," and similar properties, or "comparables," that have been sold within certain time limits. Recently, two ways of automating the sales comparison approach have been developed. The most common of these is to employ a statistical method such as multiple regression analysis (MRA). MRA is used to construct a "model" or equation to predict sales prices or to explain differences in sales prices on the basis of observed differences in sales prices, circumstances of sales, and property characteristics.^{16/} The second way of automating the sales comparison approach has been to use the computer to select the comparables and sometimes also to develop adjustment factors, the use of which will be discussed below.^{17/} The advantages of using the computer to select comparables include greater speed and flexibility in the selection process and a more scientific and less haphazard means of selecting comparables. It is likely, however, that a conventional, manual application of the sales comparison approach would be most often used in the appraisal of separated rights in real estate, and this method will be described in more detail than the available automated methods.

^{16/} See International Association of Assessing Officers, Improving Real Property Assessment (Chicago: International Association of Assessing Officers, 1978), pp. 210-250. Another technique known as the "adaptive estimation procedure" or "feedback" has also been used; see R. Carbone and R.L. Longini, "A Feedback Model for Automated Real Estate Assessment," Management Science 24 (November 1977): 241-248.

^{17/} Improving Real Property Assessment, pp. 194-198 and 250-252.

There are six steps in the conventional, manual application of the sales comparison approach. The first step is to specify a set of property characteristics that (a) may be used to assign both subject properties and comparables to the class of properties that constitutes the submarket being analyzed and (b) affect property value. Such characteristics might include: either the current use or a proposed use; location or surrounding development; the nature and extent of mineral resources; geological features; structural features; rent and expense amounts; land-use controls; and date of sale. (Stratification is also commonly used in automated applications of the sales comparison approach.)

Second, appropriate units of comparison are specified in order to account for differences in the size of subject and comparable properties. In the case of separated rights in real estate, value per acre or square foot of land or building area might be appropriate.

Third, properties that are most comparable to each subject property must be selected. The number of comparables selected is usually at least three and less than ten. The selection traditionally has been done unscientifically and somewhat haphazardly, due in large part to limited knowledge of, or access to, sales data. (Automated methods for identifying comparables include selected sales listing based on multiple sorts, iterative search routines, during which selection criteria are revised until a desired result is obtained, and dissimilarity functions, such as the Euclidean distance metric.)

Fourth, dissimilarities among comparables themselves and between the comparables and each subject property are noted and estimates of their effects on value are made. As an example, suppose that a comparable single-family residence has four bedrooms, while the subject single-family residence has only three. In order to estimate the effect on value of the additional bedroom, an appraiser simply searches through the set of comparables until at least two comparables are found that are alike except that some have four bedrooms and the others three. The appraiser notes any differences in sales prices between the four-bedroom properties and the three-bedroom properties and attributes the differences to the value added by the additional bedroom. Similar comparisons are made for all other characteristics identified in the first step.

Fifth, adjustment factors are developed to compensate for the dissimilarities noted between the subject property and the comparables. These factors are used to adjust the comparables. If a characteristic of a comparable adds to the value of the comparable relative to the subject property, a downward adjustment in the actual sale price of the comparable is made. Similarly, if a characteristic of a comparable reduces the value of the comparable relative to the subject property, an upward adjustment in the sale price is made. The result of this process, which is repeated for each of the characteristics identified in the first step, is a set of adjusted sales prices for the comparables. (The coefficients of the independent variables in an MRA equation can be used to develop these adjustment factors.) These adjusted sales prices are preliminary indicators of the market value of the subject property.

The sixth and final step is to formulate an opinion of the value of the subject property based on these adjusted sales prices. Usually greater weight is given the comparables to which fewer or smaller adjustments were made. Where ample sales data are available as can be the case with mineral rights in some areas, the sales comparison approach tends to be the most objective and reliable of the three approaches to value.

3.2.2 Income Approach

The income approach refers to several different techniques for finding the present value of income that a property is anticipated to generate in the future. The approach is, therefore, an appropriate way to appraise income-producing properties such as mineral rights and air rights. The income approach is based on the premise that the value of such a property is directly related to the amount, duration, and certainty of the income that will be generated by the property. The concept of time preference, that is, that income receivable or anticipated in the future is always worth less than an equal amount of money in hand at the present, underlies all income approach techniques. The degree of time preference can be viewed as a function of four factors: (1) anticipated loss in purchasing power (inflation), (2) loss in liquidity, (3) cost of loan or investment management, and (4) risk. These factors are combined to form a capitalization rate, which is analagous to an interest rate. A capitalization rate is the relationship between income and value, as in the formula,

$$R = I/V, \quad (1)$$

where R is the capitalization rate, I is income, and V is value. Thus, if the income from a property and an appropriate capitalization rate can be determined, property values can be estimated by simply rearranging this formula, as follows:

$$V = I/R. \quad (2)$$

Hence, if annual income equals \$10,000 and the capitalization rate is 0.16, value is \$10,000/0.16, or \$62,500. An examination of this example will reveal that for a given amount of income, a higher capitalization rate will result in a lower property value, and vice versa. Moreover, the greater the risk, the loss of purchasing power, and the like, the greater the capitalization rate. It should be noted that the above formula is in the most basic or elemental form. It is possible to expand capitalization rate formulas to allow for such things as changes in the income period, variable income, and variable interest rates. Given the relative volatility of interest rates in the recent past, such refinements bear consideration in many situations.

There are essentially two approaches to the derivation of capitalization rates: direct sales analysis and indirect methods. As the term implies, direct sales analysis involves the extraction of overall capitalization rates through a comparison of income data and sales prices for similar properties using formula (1).^{18/} In direct sales analysis, the appraiser must stratify sales on the basis of property characteristics that logically result in similarities in the following factors: (1) the discount rate, which is the rate of return required to attract investment in a property; (2) remaining economic life of buildings or other improvements, which is the remaining period in which the buildings or improvements are expected to contribute (positively) to the value of the total property; (3) the income path, which is the expected direction and rate of change in the current or first year's normal net income;^{19/} and (4) the percentage of income attributable to the buildings. Thus, in direct sales analysis, properties are stratified according to such characteristics as property type (e.g., office buildings, apartments, etc.), size (e.g., number of units, rentable area, etc.), and location.

^{18/} Direct sales analysis is discussed in more detail in Improving Real Property Assessment, pp. 282-289.

^{19/} Normal net income will be discussed below.

Once stratification has been completed, calculation of observed overall capitalization rates is straightforward. There are two advantages to direct sales analysis: (1) the resulting capitalization rates are directly reflective of market-indicated relationships between income and value and (2) the pattern of observed rates within and among strata provide information on the reliability of the rates; if the rates within a stratum are concentrated around a central value and if the pattern of rates among strata is consistent with expectations, the rates can be judged to be reliable. On the other hand, if rates vary greatly and if the pattern of rates is illogical, the rates can be judged to be unreliable.

If there are insufficient sales of income-producing properties or if direct sales analysis cannot be relied upon for other reasons, a number of indirect capitalization methods can be employed. These fall into two types: mortgage-equity analysis and residual techniques (e.g., land residual, building residual, and property residual). Each of the indirect methods of capitalization requires preliminary estimates of certain variables before the overall relationships between income and property values can be estimated. These variables are listed in the following table.^{20/}

The details of the various indirect capitalization methods will not be presented here inasmuch as they are well described in a number of widely available appraisal texts. There are, however, two additional general subjects that need to be addressed before we leave the subject of indirect capitalization methods: the components of an overall capitalization rate and the analysis of income streams.

An overall rate is viewed as consisting of two and sometimes three components: (1) a discount rate, which, as previously noted, is the rate of return required to attract investment in a property or a return on an investment; (2) a rate that provides for the return of an investment, and (3) in certain appraisals for ad valorem tax purposes, the effective property tax rate. It is important to emphasize that the discount rate is a net rate; that is, it excludes income allocated for capital recovery (the return of investment) and includes capital gains, which is another way of obtaining a

^{20/} From Improving Real Property Assessment, p. 289.

Table 1
Estimates Required in Indirect Capitalization Methods

I. Residual techniques

A. Building residual technique

1. Discount rate
2. Remaining economic life
3. Land value
4. Income path attributable to the building or other improvements
5. Income path attributable to the land

B. Land residual technique

1. Discount rate
2. Remaining economic life
3. Building value
4. Income path attributable to the building or other improvements
5. Income path attributable to the land

C. Property residual technique

1. Discount rate
2. Remaining economic life or holding period
3. Amount of reversion (the reversion, in this case, is the projected value of the land at the end of remaining economic life or the holding period plus any remaining building value and the end of the holding period)
4. Income path of property

II. Mortgage-equity analysis

- A. Equity yield rate
 - B. Mortgage terms: interest rate, loan-to-value ratio, term of loan, amortization provision
 - C. Holding period
 - D. Percentage appreciation or depreciation in property value over the holding period
 - E. Income path of the property over the holding period
-

return on investment. Thus, it is possible for a discount rate to be greater than an overall capitalization rate, if the rate of appreciation in property value is greater than the rate at which income is prorated to recover invested capital.

From a theoretical viewpoint, the discount rate may be viewed as the sum of four components: (1) the "pure" or "riskless" rate of interest often indicated by the rate of interest on long-term government bonds; (2) compensation for loss of liquidity; (3) compensation for investment management; and (4) compensation for risk. Apart from the first component, it is virtually impossible to find data to support these theoretical components. Hence, appraisers have resorted to "band-of-investment" analysis and sales analysis. Band-of-investment analysis involves the computation of a weighted average discount rate based on separately estimated rates of return on equity capital and borrowed capital (e.g., mortgage interest rates), the weights being determined by typical loan-to-value ratios. Under sales analysis, it is possible to abstract a discount rate, often termed an "internal rate of return," by a trial and error process (which can be computerized) during which the appraiser must project the income stream and anticipated capital gains or losses at the end of an assumed investment holding period.^{21/}

With respect to returns of investments, conventional real estate appraisal practice differentiates between investments in land and investments in wasting assets such as buildings. Land is viewed as having an infinite economic life, and therefore, the annual allocation of income to the recovery of the investment in land is infinitesimal. Hence, income derived from land is capitalized at the discount rate alone. In contrast, it is necessary to provide for the recovery of investments in wasting assets such as buildings, other improvements, and producing mineral resources within a finite period of time. This is accomplished by one or both of the following means: (1) allocating a portion of income for capital recovery or (2) selling or refinancing the property at the end of a holding period. The holding period can be remaining economic life or some shorter period. In general, the shorter this period, the

^{21/} See Charles B. Akerson, "Internal Rate of Return in Real Estate Investments," a research monograph prepared for the American Society of Real Estate Counselors (Chicago: American Society of Real Estate Counselors and American Institute of Real Estate Appraisers, 1976).

more important is the estimation of the length of this period, because the farther into the future an income is to be received, the less is its effect on present worth.

Allocations of income for return of investment are made in several ways depending upon the income capitalization techniques chosen. These means of providing for a return of investment include: (1) "straight line" recapture; (2) the establishment of a "sinking fund," and (3) "annuity capitalization." Under straight line recapture, the reciprocal of remaining economic life determines the amount of income to be allocated to return of investment.^{22/} When a sinking fund is used to allocate income for a return of investment, the principle of compound interest is employed, and the amount set aside each year is the level amount that will accumulate with compound interest to the total amount to be recovered at the end of remaining economic life. Since the sinking fund method assumes that income allocated to return of investment is reinvested and earns interest, more income is allocated to return on investment than under the straight line method. Hence, the capitalized value is greater. Under annuity capitalization, an increasing amount is allocated each year to return of investment. Thus in earlier years more income is allocated to return on investment, which under the principle of time preference results in a higher capitalized property value than under the straight line or sinking fund methods. In summary, the method of providing for return of investment affects the estimate of property value.

Finally, an analysis must be made of the amount of income that will be capitalized. In most income capitalization techniques, the amount that is capitalized is net income, which is gross income from leases and the like minus certain expenses necessary to the management and operation of the property. Since the real interest is with the future net income payments and not historical net incomes, appraisers must analyze actual incomes and operating expenses in terms of whether they are typical for current market conditions and in terms of what current trends in rentals and operating expenses suggest that the future income stream will be. The assumptions that are made regarding the series of net income payments, in turn, influence the

^{22/} The straight line method, as noted below, also carries with it the assumption that total income declines in a linear fashion such that all of the income received in the last year is allocated to return of investment.

choice of capitalization techniques. If, for example, the series of payments were assumed to decline by a constant amount each year, straight line capitalization is appropriate. If the income stream were assumed to be in the form of a variable annuity that can be converted into an equivalent level annuity, an annuity capitalization method can be used.^{23/} If the income stream were assumed to be in the form of an annuity that extends into the future without termination, perpetuity capitalization can be used (equation 2 is the formula for capitalizing a level perpetuity). Lastly, if the income stream cannot be assumed to fit any of the above patterns, a separate calculation of the present value of each annual net income payment can be made. This last alternative often is the choice of necessity in the case of new developments and producing mineral properties.

In conclusion, in order to use the income approach in a supportable fashion, appraisers must have current data on market rentals and lease provisions, operating expenses, mortgage interest rates and terms, and investors expectations with respect to desired rates of return on investments given their assumptions regarding the pattern and duration of income streams. Thus, the magnitude of the data problem in using the income approach should not be minimized. This is especially true for items for which the amount of market activity is small or the precise extent (and value) of the resource being appraised are unknown.

3.2.3 Cost Approach

The cost approach, which is applicable only to improved properties, is based on the assumption that the value of a property equals the cost of acquiring an equally desirable substitute property--in this case the process of acquisition being the production of the substitute.^{24/} Under the cost approach, therefore, the appraisal process begins with the hypothetical substitution of the property being appraised with a new but otherwise

^{23/} For a discussion of stabilizing variable annuities, see Improving Real Property Assessment, pp. 308-312.

^{24/} This discussion of the cost approach is drawn from Improving Real Property Assessment, pp. 163-164.

identical property on the same site. The site is appraised, using the sales comparison or income approaches, as if vacant and available for development at its highest and best use. The market value of the improvements is determined in two main steps. First, the current costs of construction of these improvements are estimated. Market value, however, is based on improvements in their current condition and circumstances. If the current cost of the improvements is greater than their current market value, the second step is to estimate the differences between cost and value. This difference is termed accrued depreciation or diminished utility. To summarize, the three steps in the application of the cost approach are: (1) the estimation of land value; (2) the estimation of cost new; and (3) the estimation of accrued depreciation.

The estimation of cost new requires a detailed description of the improvements and the collection of information on the costs of construction labor, building materials, and other direct and indirect costs of construction. Such data are available from a number of published sources, which accounts for the widespread use of the cost approach by assessors.

If the hypothetical improvement that is being costed is a replica of the existing improvement, an estimate of reproduction cost is made. If the hypothetical improvement is identical in terms of utility, an estimate of replacement cost is made. Often reproduction cost is greater than replacement cost, which has implications for the estimate of accrued depreciation, since true market value is the same in either case. Accrued depreciation results from physical deterioration, functional obsolescence, and economic obsolescence. Physical deterioration has to do with the state of repair of an improvement. Functional obsolescence has to do with how well designed a structure is in terms of current standards of performance, use, or architectural taste, and the concept of replacement cost, in effect, takes some aspects of functional obsolescence into account. Economic obsolescence has to do with reductions in utility due to conditions outside the boundaries of a property itself, such as the effects that the opening of a regional shopping center might have on existing strip commercial development.

The estimation of land value and accrued depreciation require sales data, rental and operating expense data, or both. These data requirements can limit the accuracy of value estimates based on the cost approach. For these reasons, the cost approach is best in the appraisal of new construction; is useful in the appraisal of all properties for which there are few sales or that are not income-producing; and is virtually the only approach that can be applied to owner-occupied, single-purpose properties--for example, most industrial and manufacturing properties. In the context of this report, however, the cost approach has only limited applications in the valuation of producing mineral properties and of air and subsurface rights.

3.3 APPLICATION OF BASIC APPROACHES TO SEPARATED RIGHTS

The applicability of any of the three basic appraisal approaches (sales, income, or cost), to the valuation of separated rights in real estate depends on the type of right in question. In this section, the circumstances in which the three approaches are typically used in the valuation of a particular type of right will be summarized.

3.3.1 Air and Subsurface Space Rights

The utilization of air space, as noted previously, generally occurs over railroad and highway rights of way in densely developed urban areas where land values are high. The general practice is to construct a platform over a right of way that, in effect, is a man-made substitute for the surface of the earth. A more-or-less conventional building then is constructed on the platform. Such developments of air space become attractive when the costs of acquiring the air rights, of constructing the platform, of providing access to it, and of constructing a suitable building compare favorably with the costs associated with more conventional, surface developments. Airspace developments may be particularly attractive when visibility of the development is an important consideration and when there are obstacles to more conventional surface developments such as a prohibitively high cost of assembling a suitable parcel from existing smaller land holdings, the costs of terminating leases, and the costs of demolishing existing structures. In other

words, air space can represent readily available "new" land. Similar considerations apply to the use of subsurface space; such space may represent either readily available new land or a readily available structure.

Of course air or subsurface space can be and often is leased instead of purchased. Nevertheless, interest in the value of the rights to such space remains, particularly when the lease is a long-term one and when the leasehold interest may be taxable.

As noted previously, instances in which there are air and subsurface space developments are comparatively rare, and in the case of the use air space, the developments are fairly substantial and singular in nature. Consequently, sales of air rights alone or of improved air rights properties also are rare, and a direct use of the sales comparison approach is seldom feasible. Similarly, direct applications of the cost approach are not feasible. The general unavailability of comparable sales data has led appraisers to approach the valuation of air rights indirectly, relying mostly on the income approach but also using analyses of construction costs and land sales.

The general appraisal approach has been to contrast air space developments with surface developments and to develop "formulas" for accounting for the effects of the differences noted on property value. The same general formulas also are applicable to the valuation of subsurface rights. Three such formulas exist: Kuehnle's, White's, and the formula of Daniel, Mann, Johnson and Mendenhall.^{25/} These formulas, it might be pointed out, are most applicable to an appraisal made as part of a study of the feasibility of a proposed airspace development. The value of the air rights of an existing air rights development would be best appraised by using a land residual technique, although the applicability of the land residual technique is an unresolved issue.^{26/} In any case, the land residual technique

^{25/} For a very lucid discussion of the Kuehnle and White formulas and also of other valuation approaches, see William R. Wright, The Law of Airspace (Indianapolis: The Bobbs-Merrill Company, Inc., 1968), pp. 305-329.

^{26/} Compare Wright, Law of Airspace, pp. 314-316, with Richard M. Rhodes, "Air Rights, Subsurface Easements, and Other Fractional Interests," The Appraisal Journal 42 (April 1974), pp. 263-265.

is conceptually similar to the Kuehnle and other formulas.

The Kuehnle formula approaches the valuation of air rights by using the "before-and-after" principle. Under this principle, the value of air rights is equal to the value of the site before the separation of the air rights minus the economic value that has been lost due to any reduction in functional utility occasioned by the airspace construction, any additional construction costs, and any additional investment carrying charges. Formally expressed, the Kuehnle formula is:

$$V-(X+Y)-I = A \quad (3)$$

and

$$V-A = R \quad (4)$$

where V is land value prior to the separation of the air rights, X is the economic value lost due to reduction of functional utility (net income) in modifying the building for airspace construction, Y is the additional cost of construction, I is the interest on the investment for the increased period of construction as a result of the separated interests, A is the value of air rights, and R is the value of the "remainder." The formulas of White and of Daniel, Mann, Johnson and Mendenhall are conceptually similar to Kuehnle's original formula but incorporate successive refinements. The latter two formulas are expressed as follows:

$$\text{(White)} \quad V_C - X + (C-D) - I = A \quad (5)$$

$$V_C - A = R; \quad (6)$$

and

(Daniel, Mann,
Johnson & Mendenhall)

$$V+D+S+P-X-Y-I = A \quad (7)$$

where the variables are as defined in table 2. It can be seen that the formulas are conceptually similar. Moreover, all are predicated on the appraiser's being able to estimate the value of surrounding or comparable parcels of vacant land (if any), all require detailed comparisons of the costs construction, including interim financing, and all require the appraiser to compare the income-producing capacity of the development in question with the capacity of a more conventional structure.

Table 2
Comparison of Specification of Air Rights Valuation Formulas

Kuehule formula	White formula	Daniel, Mann, Johnson & Mendenhall formula
A = value of air rights	A = value of air rights	A = value of air rights
V = land value prior to separation of air rights	V _c = land value by comparison in fee simple, vacant but improved with all utilities at lot line	V = comparable land value
	D = savings to air rights pur- chaser or lessee in ex- cavation and foundation costs, demolition, tenant relocation, and income losses during relocation and demolition	D = savings due to absence or reduction in demolition and foundation costs
		S = value attributed to site pro- minance or improved access
		P = savings due to readily assembled large parcel
X = Economic value lost due to reduction of functional utility (net income) in modifying the building for airspace construction	X = loss of residual value from functional or economic obsolescence arising from creation of the air rights	X = reduction in utility of structure due to design or functional obsolescence
Y = additional cost of con- struction		Y = excess construction costs
	C = added capital improve- ment costs to air rights purchaser or lessee in construction of building	
I = Interest on investment for additional period of construction	I = added interest and carrying charges as a result of added improvement costs	I = additional interest incurred over a longer construction period
R = value of remainder	R = residual value of fee interest	

In conclusion, the appraisal of air rights is a difficult task that would test the mettle of the most skilled and experienced appraisers.

3.3.2 Mineral Rights

In contrast to the comparatively few instances of air and subsurface rights developments, there are probably hundreds of thousands of instances in which mineral rights are separately owned. Not surprisingly, a substantial body of literature, including some excellent specialized treatises, has been developed.^{27/} This literature recognizes differences in practices with respect to the valuation of rights to solid minerals, which must be mined, and rights to oil and natural gas, which require the drilling of wells. There are, in turn, differences in practices concerning the valuation of oil properties and of natural gas properties.^{28/} Furthermore, distinctions are drawn between producing and non-producing properties.

In the case of non-producing properties, there often is considerable market activity as producers attempt to purchase contiguous parcels in order to improve their competitive positions and in order to reduce eventual per-unit operating costs by amassing holdings sufficient to achieve economies of scale. At the same time, other investors also may be speculating in mineral rights. In such situations, there can be a sufficient volume of sales to warrant the use of the sales comparison approach to establish rather speculative estimates of the market value of non-producing mineral rights.

In the valuation of producing mineral properties, the focus shifts to income streams generated by the sale of minerals and fuels, and it is important to note that the income generated from a producing mineral property often is shared between two sets of interests: "royalty" interests and "working" interests. The owner of the mineral rights retains the royalty interest, while the producer of the minerals has the working interest. The two interests are created when the owner of the mineral rights enters into a lease with a producer (e.g., an oil company or a mining company) that allows the producer to explore for and extract minerals. Such a lease typically

^{27/} See, for example, J. M. Campbell, Oil Property Valuation (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1959) and R. D. Parks, Examination and Valuation of Mineral Property, 4th ed. (Cambridge, Massachusetts: Addison Wesley Publishing Co., 1957).

^{28/} Properties that produce both oil and gas are treated as oil-producing properties.

specifies such things as the term of the lease, the royalty payment (which traditionally is about 1/8 of gross sales, but may vary from lease to lease), "bonuses" and other payments to the lessor, and other provisions.^{29/} It is not uncommon, however, for both royalty and working interests to be further subdivided in very complex patterns, which are disclosed in a "division order". While it is theoretically possible to place a valuation on each of these interests, the objective of most valuation exercises is to obtain an estimate of the sum of the interests of the market value of the mineral resource in question. Should it be necessary to value each interest separately, it should be pointed out that producers take the greater risks and therefore working interests would be capitalized at higher rates than royalty interests.

The salient characteristics of every mineral property is its singular nature. There are, however, some general similarities in the factors that must be considered in the valuation of all types of mineral properties. One major factor is that mineral resources are non-renewable. Income streams are therefore finite, and an estimate of the duration of the income stream is an important step in the appraisal of a producing mineral property. The duration of the income stream and the magnitude of each annual net income are determined by the interaction of a number of factors, including the nature and size of the reserves in question, surrounding geological conditions, demand for the mineral resource, economic conditions, available technologies for extracting and transporting the mineral, and governmental actions and policies. In general, both rates of production and annual net income are quite variable, but in virtually all cases they decline over time. The interaction of the kinds of factors mentioned above also establishes an "economic limit" or "cut-off value" which is the minimum price for the resource that will support profitable operations in a given set of circumstances or at a given point in time. In other words, producers of mineral resources will halt production whenever the economic limit is reached, even though the mineral resource may not physically be totally depleted. It should be noted that in some cases,

^{29/} For a discussion of oil and gas leases, see Judon Fambrough, "Hints on Negotiating an Oil and Gas Lease," Journal of the American Society of Farm Managers and Rural Appraisers 44 (October 1980): 8-15.

(e.g., where start up costs are large and prices are expected to rise) it may be preferable to continue to sell below costs. Of course, changes in circumstances can cause the economic limit to fall below the current market price for the mineral resource in question, and production may be sporadic. In view of this situation, the general practice in the valuation of producing mineral properties is to estimate the net income that is expected for each year the property is expected to produce income and to sum the discounted present values of all such net incomes.

The proper method of discounting this cash flow is a subject of some debate. Formerly, a sinking fund method, such as the Hoskold premise, was frequently employed, particularly in the case of mines. Most analysts today appear to question whether investors actually behave in a way that is consistent with the Hoskold premise.^{30/} Thus contemporary practice favors the use of a single discount rate.

With respect to the development of discount rates and overall capitalization rates, there is general agreement, at least in the case of oil and gas properties, that an analysis of sales of producing mineral properties provides the best evidence of discount rates, despite the rarity of such sales and the fact that no two properties are alike.^{31/}

Since the mathematics of the valuation of mineral rights are quite involved, an example will not be presented here. This discussion of the valuation of mineral rights also gives scant attention to the crucial element of the estimation of recoverable reserves. Making such estimates, however, requires an extensive knowledge of geology, a subject that is outside the scope of this paper. The credibility of an appraisal of a mineral property depends, however, on the geologic data available to the appraiser and the appraiser's ability to interpret that data.

^{30/} Roland D. Parks, "Valuation of Mineral Property," in Valuation of Oil and Mineral Rights (Chicago: International Association of Assessing Officers, 1972), p. 42.

^{31/} Robert H. Paschall, "Valuation of an Oil and Gas Producing Property," in The Valuation of Oil and Mineral Rights, p. 3. Also Babson and Sheppard (petroleum engineers), "Discount Rate Study for the Western Oil and Gas Association for California Producing Property Purchasers: 1977 through 1979" (Santa Fe Springs, California, 1980).

3.3.3 Water Rights

Despite the fact that water rights can be sold, transferred, mortgaged, or bequeathed, the literature on the appraisal of separated water rights is scant.^{32/} This lack of attention, however, may be due to the fact some water rights can be appraised in a straightforward manner using the sales comparison approach or the income approach. Application of the sales comparison approach is, of course, limited by the availability of sales of comparable water rights properties. Factors that affect comparability include: (1) the quantity of water that may be appropriated; (2) accessibility of the water right; (3) the distance between the points where water is obtained and where it is used; (4) the costs of water from alternate sources; (5) the expenditures associated with putting the water to beneficial use; (6) the quality of the water; (7) the use to which the water is put; (8) the reliability of the water source; and (9) restrictions on the transferability or use of the water right.^{33/} When the income approach is used, the value of water rights is treated as residual. In other words, separate estimates of the value of the land and improvements associated with putting the water to use must be made so that portions of the total net income can be allocated to those estimated values. Remaining net income is then capitalized to obtain an estimate of the value of the water rights alone.

Another approach to the valuation of water rights combines the cost and income approaches to compute the present value of the cost savings associated with owning a particular water right in comparison to the costs of obtaining the same amount of water from the least expensive substitute source, assuming that the costs associated with using the water rights in question are less than the costs of using the substitute source.^{34/} Under this approach, the sum of the annual operating expenses and the annual amount

^{32/} Perhaps the best work on the subject is California State Board of Equalization, Property Tax Department, Assessment Standards Division, Valuation of Water Rights, Assessor's Handbook 545 (Sacramento, 1971); for other works; see the bibliography.

^{33/} Valuation of Water Rights, p. 19.

^{34/} Ibid., pp. 20-23.

necessary to recover or amortize the current replacement costs of existing water facilities (land, plant, and equipment) or development costs of proposed facilities over the economic life of the facility in question, are calculated for both the source of water being appraised and the substitute, in order to arrive at an estimate of the total annual expense of using each source of water. Next the total expenses associated with the source being appraised are subtracted from the total expenses of the substitute to obtain an estimate of the annual savings associated with using the source in question. This estimate of the annual savings is then capitalized as a level perpetuity to obtain an estimate of the value of the water rights in question.

3.3.4 Development Rights

As pointed out in the introduction, the purchase or transfer of development rights is regarded as a preservation technique. In either case, the value of the development rights becomes an issue. In theory, the appraisal of development rights involves a straightforward application of the "before-and-after" principle; that is, the value of the development rights is equal to the value of the property prior to the separation of the development rights minus the value of the property after the separation of the development rights. The "before" valuation is made using whichever appraisal approach is appropriate in the circumstances. The "after" valuation may be more problematic, particularly in the case of vacant land.

The purchase or transfer of the development rights to vacant land is used to preserve the agricultural or open space character of the land. Consequently, the objective of the "after" appraisal is to provide an estimate of the value of the land when its use is restricted to agriculture or some other open-space purpose such as recreation, while the "before" valuation is based on the highest and best use of the land. In most instances, the before valuation would rely on the sales comparison approach and would be based on sales of comparable properties to developers, although other suitable land valuation methods such as the cost-of-development method might be used if there were an inadequate number of comparable sales.^{35/}

^{35/} For a brief description of the cost-of-development method and other land valuation techniques, see Improving Real Property Assessment, pp. 209-210.

There are two possible methods for estimating agricultural or other open-space use values: the sales comparison and the income approach. Each has shortcomings. When the sales comparison approach is used to estimate use value, it is important to use only sales of parcels that are not subject to urban or development pressures. There are obvious difficulties in identifying such sales, since the intentions of buyers are not a matter of record. The usual approach to this problem is to use sales between farmers of parcels that are distant from urban areas. There are, however, two problems with this approach. On the one hand, the use of such sales may result in an understatement of the "true" use-value of land subject to urban or development pressures, because per-acre sales prices for distant parcels may be lower than the per-acre use values of close-in parcels because of a general gradient in land values away from market centers. This gradient can be explained largely by the transport costs to move agricultural products to market. On the other hand, the per-acre sales prices of farmer-to-farmer transactions may be higher than "typical" per-acre use values, since many sales between farmers result in the expansion of an existing operation, and it is widely believed that farmers interested in expanding their operations are willing to spend more per-acre than farmers beginning a "new" operation.

These difficulties with the comparable sales approach have lead to a general reliance on the income approach. There are two possible applications of the income approach: (1) capitalization of actual land rents and (2) capitalization of residual income accruing to land after the other factors of production have been satisfied. In the case of agricultural land, data on residual income can be developed from financial data on farm operations and are available from the Farm Enterprise Data System (FEDS) of the Community Economics Division of Economic Research Service of the U.S. Department of Agriculture and from other sources.^{36/} The development of an appropriate capitalization rate is more difficult, because direct sales

^{36/} David E. Boyce, Janet Kohlhasse, and Thomas Plant, Estimating the Value of Development Easements on Agricultural Land: Methods and Empirical Analysis, (Philadelphia: Regional Service Research Institute, 1977), p. 48.

analysis tends to suggest lower-than-logical, and sometimes negative, overall capitalization rates. This is apparently because farmers and others will accept very low current rates of return because they anticipate substantial appreciation in land values and, perhaps, future increases in agricultural productivity as well. This problem is solved in the administration of use-value assessment laws by ignoring market evidence and by arbitrarily developing a "reasonable" capitalization rate.

3.4 TAXATION ISSUES

The taxation of separated rights in real estate gives rise to a number of issues that relate to the valuation of separated rights. These issues include: (1) whether the value of a separated right is an appropriate basis for taxation; (2) whether valuations for tax purposes are accurate; and (3) whether the necessary information is available to assessing officers to produce reasonably accurate valuation. These issues will be briefly discussed in this section.

3.4.1 Property Value as a Basis for Taxation of Separated Rights

The appropriateness in a modern society of property value as a basis for taxation is an enduring area of concern. Whether judged by the principles of ability-to-pay or benefits-received, Adam Smith's canons of taxation--equity, certainty, convenience, efficiency, and adequacy, or some other set of criteria, the property tax is usually found wanting. But other taxes also have their shortcomings. For this reason and also because the property tax is a well-established institution, most students of government finance accord the ad valorem property tax a conditional endorsement.^{37/} Accordingly, the question of the general appropriateness of the ad valorem property tax will not be considered further in this report, and it is concluded that privately owned separated rights in real estate generally should be subjected to property taxation.

There is an exception to this general conclusion, however. It is widely believed that ad valorem taxation of mineral rights is undesirable from the

^{37/} See, for example, Richard A. Musgrave and Peggy B. Musgrave, Public Finance in Theory and Practice, 2d. ed. (New York: McGraw-Hill, 1976), p. 346; and Wayland D. Gardner, Government Finance: National, State, and Local, (Englewood Cliffs, N.J.: Prentice-Hall, 1978), pp. 369-370.

standpoint of the wise use of nonrenewable resources.^{38/} Ad valorem taxation of mineral deposits creates an incentive to extract those deposits as quickly as possible, because total property tax burdens are reduced. This incentive can be illustrated by a simple example that involves two hypothetical mines (see table 3).^{39/} Each mine has a reserve of 3 million tons of ore, earns a net operating profit of \$4 per ton, and is subjected to property taxes at a rate of 2 percent of market value. Mine Y has a production rate of 300,000 tons per year, while Mine Z's production is 250,000 tons per year. Thus, Mine Y's remaining life is ten years, and Mine Z's is twelve years. A capitalization rate of 16 percent is used to estimate the present worth (current market value) of each year's net income (annual net income is \$1,200,000 in the case of Mine Y and \$1,000,000 in the case of Mine Z). The indicated current market value of these income streams together with the property taxes paid are presented in table 3 for each year of remaining life of each mine. This example demonstrates that Mine Z pays more in property taxes over the life of the mine, even though annual property taxes are lower than Mine Y for five years. The incentive to extract resources as rapidly as possible also is reflected in other ways: property taxes per ton of production or as a percentage of net income are lower for Mine Y than for Mine Z. This example also demonstrates the concept of time preference and the effects of compounding; income in hand or to be received in the near future has a greater present value than income to be received at a more distant time.

Whether the incentive to extract as rapidly as possible is of practical significance depends on a number of factors, including the accuracy of the valuation, the magnitude of property taxes in relation to the price of the mineral resource in question, the plant and technology used to extract the resource, and operating expenses generally.

^{38/} For summaries of this problem, see Thomas F. Stinson, State Taxation of Mineral Deposits and Production (Washington, D.C.: U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, 1978), pp. 2-13; and Karl E. Starch, Taxation, Mining, and the Severance Tax, Information Circular 8788 (Washington, D.C.: U.S. Department of the Interior, Bureau of Mines; distributed by National Technical Information Service, 1979), pp. 4-16.

^{39/} This example is based on an example in Robert H. Paschall, "A Comparison of Mine Tax Systems," Assessors Journal 12 (December 1977): 221-237; at pp. 227-228.

Table 3
ILLUSTRATION OF INCENTIVE TO SPEED EXTRACTION OF
RESOURCES UNDER AD VALOREM TAXATION OF RESERVES

Year	Present Worth Factor ^{a/}		Current Market Value		Property Taxes	
	Mine Y	Mine Z	Mine Y	Mine Z	Mine Y	Mine Z
1	4.83	5.20	\$5,760,000	\$5,200,000	\$115,920	\$104,000
2	4.61	5.03	5,532,000	5,030,000	110,640	100,600
3	4.34	4.83	5,208,000	4,830,000	104,160	96,600
4	4.04	4.61	4,848,000	4,610,000	96,960	92,200
5	3.68	4.34	4,416,000	4,340,000	88,320	86,800
6	3.27	4.04	3,924,000	4,040,000	78,480	80,800
7	2.80	3.68	3,360,000	3,680,000	67,200	73,600
8	2.25	3.27	2,700,000	3,270,000	54,000	65,400
9	1.61	2.80	1,932,000	2,800,000	38,640	56,000
10	0.86	2.25	1,032,000	2,250,000	20,640	45,000
11		1.61		1,610,000		32,200
12		0.86		860,000		17,200
			Total:		\$774,960	\$850,400

Note: ^{a/} These factors are obtained from the "present worth of one per period" column of a compound interest table for a 16 percent interest rate.

Taxes have another effect on the extraction of resources: they raise the economic limit or cut-off value of ore. Thus, it becomes uneconomical to extract low-value ore and some oil and gas. This effect, however, is not peculiar to ad valorem taxes.

3.4.2 Accuracy of Valuations for Tax Purposes

The accuracy of valuations for tax purposes is best gauged by comparing those valuations with other indicators of market value such as arm's-length, open-market sales prices. Such sales occasionally exist in sufficient numbers. Usually, however, less direct evidence must be relied upon. Valuations made in conformance with accepted appraisal practices, for example, can be assumed to be reasonably accurate in the absence of evidence to the contrary, provided that they are up-to-date. Unfortunately, comprehensive programs of evaluating assessment practices are uncommon except in California. Consequently, it is necessary to rely upon still less direct evidence: the existence of published guidelines for the valuation of separated rights. Such guidelines provide assessor's with the information they need to appraise such properties correctly and uniformly.

Our review of the property tax literature revealed that only eleven states have published guidelines on the valuation of the types of separated interests in question.^{40/} Most of the published material deals with the valuation of mineral rights, including oil and gas properties. The valuation of minerals is most exhaustively dealt with in the manuals of California and Texas, however. Some jurisdictions, including a number of state property tax supervisory agencies employ professional engineers and geologists to appraise mineral properties, thereby lessening the need for published guidelines. No state has published guidelines on the valuation of air rights, although they are mentioned in California's handbook on the appraisal of mines. Only California has published information on the valuation of water rights. Information on the valuation of development rights has been published in Maryland and Massachusetts. One must conclude that only in comparatively few states are

^{40/} These states are Arkansas, California, Colorado, Illinois, Indiana, Nevada, Oregon, Tennessee, Texas, West Virginia, and Wisconsin, although Alaska, Kansas, Louisiana, Minnesota, Mississippi, and Vermont have published related materials.

separated rights in real estate likely to be appraised with reasonable uniformity and accuracy.

3.4.3 Availability of Appraisal Data

In addition to employing an acceptable appraisal method, adequate amounts of reliable data also are necessary to accurate valuations. Information on the existence of a separated right comes from the recording of a deed, and most assessors are automatically supplied with copies of all deeds, which are public documents. Basic deed information is sometimes put on special maps of mineral interests. The State of West Virginia, for example, has a mineral mapping program in addition to its surface mapping program.^{41/} Mineral maps are sold for \$100 per sheet. The California Division of Mines and Geology also publishes mineral maps as well as a directory entitled "Mines and Mineral Producers Active in California During 1978" and other materials.^{42/} In several oil- and gas-producing states, private firms produce similar maps, which are copyrighted and sold for \$30-100 a sheet.^{43/}

Sale price data for parcels that have been sold are generally available in thirty-seven states.^{44/} Income and expense data are gathered by a number of assessment jurisdictions, but these data are generally held to be confidential.

^{41/} For a description of this program, see Robert A. Hoffman, "Mass Appraisal of West Virginia Coal (an Appraisal Experience)," Property Tax Journal 1 (March 1982): 63-74. (The Property Tax Journal formerly was the Assessors Journal.)

^{42/} California State Board of Equalization, Assessment Standards Division, "To County Assessors Only" (March 10, 1981).

^{43/} Four such firms are: Heydrick Map Services, San Antonio Texas; Kansas Blueprint Company, Inc., Wichita, Kansas; Oklahoma Oil Maps, Oklahoma City, Oklahoma; and Pomco Map Service, Casper, Wyoming.

^{44/} U.S. Bureau of the Census, State and Local Ratio Studies, Property Assessment and Transfer Taxes, Series GSS No. 99 (Washington, D.C.: U.S. Government Printing Office, 1980), p. 16.

4. SPECIFIC DISCUSSION OF STATUTES AND CASES

In the area of separated property rights, mineral rights are by far the type most frequently addressed in statutes. Very few states deal specifically with air rights; most states, however, have a statute specifying that ownership of real estate means the surface area and the areas upward and downward indefinitely. (Most states have also provided that in some instances property owners in certain areas cannot erect structures above a certain height in order to preserve air approaches to airports. There are also states that have authorized localities to acquire air rights for certain purposes, such as redevelopment. Presumably these would be recorded.) Development rights are rarely addressed except in agricultural or open space preservation laws; these generally specify that transfers of development right (also referred to as conservation or scenic easements) by a private person to a public authority are recorded in the same manner as other real estate transfers. (The concept of development rights is a relatively new one and at the present there is no private market for such rights; it is hardly surprising therefore that little statutory law exists on this subject.) Some states have provided that certain types of easements may be recorded; the most commonly mentioned are solar easements and facade easements for historic preservation. Presumably, these easements are eligible for recordation because they are somewhat extraordinary and may have a direct effect on title by virtue of the fact that such easements may affect the marketability of real estate as opposed to easements that are commonly attached to most parcels. The law of water rights generally appears to deal with the rights of use, not ownership; water itself is generally considered to be the property of the state (at least in the states west of the Mississippi River).

In some states, exactly what is eligible for recordation has been decided in the courts, but it would appear that every state has some statutory provision for the creation, conveyance, and recordation of real estate interests. Theoretically then, any interest in a parcel of real estate could be recorded in more or less the same manner as ordinary transfers of real estate. Therefore, the determination of who owns what separated rights is possible, the ease of determination depending upon the quality of the local system of recordation.

A study of cases involving air and subsurface space rights, mineral rights, underground water rights, and development rights reveals many interesting facts about separated rights.

4.1 AIR AND SUBSURFACE SPACE RIGHTS

While reported cases recognizing air and subsurface space rights are not uncommon, cases discussing separated air and subsurface space rights are much more rare. The idea of separating air and subsurface space rights is quite old, however, since it was discussed in the writings of 17th century English legal authorities like Coke and Sheppard.

The doctrine of separated air and subsurface space rights also appeared very early in American case law: Mills v. Pierce, 2 N.H. 9, 12 (1819) ("one person may own the lower apartments in a house; and another person the chamber" - citing a number of English precedents); Loring v. Bacon, 4 Mass. 574, 575 (1808) ("although...the parties consider themselves as severally seised of different parts of one dwelling-house, yet, in legal contemplation, each of the parties has a distinct dwelling-house adjoining together, the one being situated over the other"); Cheeseborough v. Green, 10 Conn. 318 (1834); Winston v. Cornish, 5 Ohio 477 (1832).

Some of the cases relating to separated air and subsurface space rights appear to have originated with statutory rights. A perfect example is Association of Owners, Satellite Apartment, Inc. v. Otte, 38 Colo. App. 12, 550 P.2d 894 (1976), in which a Colorado statute, recognizing creation of real property estates in air space owned by persons other than the owners of the land below, was applied to condominium units. Statutes governing air rights vary among the states, and consequently so does case law based on statutes.

A number of cases have dealt with the conveyance of rooms or suites, or other portions of buildings. It is generally held in these cases that the rights of ownership over this air space terminate upon destruction of the building. See, e.g., Hahn v. Baker Lodge, 21 Ore. 30, 26 P. 166 (1891). The concept of a condominium is primarily the creation of separate ownership of spaces within a building, and, at least in some states, it is not possible to create the separate ownerships until the building has been constructed.

In Otte, supra, the separated air rights could be regarded as having been created by the recording of a condominium declaration, but the cases also

deal with rights clearly created by deed of sale apart from the surface rights, as in Penn Central Transportation Co. v. City of New York, 438 U.S. 104 (1978), where Penn Central contracted to sell air rights above its railroad tracks. In addition, air rights can be reserved and the rest of the land conveyed. Pearson v. Matheson, 102 S.C. 377, 86 S.E. 1063 (1915)

Grants of rights in air and subsurface space can involve leases and easements. For example, in Hartford Electric Light Company v. Town of Wethersfield, 165 Conn. 211, 332 A.2d 83 (1973), air rights easements were created by lease. Also, Brunschwig v. Long Island R.R., 41 Misc. 2d 244 N.Y.S.2d 708 (Sup. Ct. 1963), involved grants of superjacent and subjacent areas and easements back for surface usage. Finally, air rights have been conveyed by "grants of term," which are essentially leases that are made indefeasible by mortgage-holders pursuant to agreement.

The majority of air rights transactions have involved railroad property and private developers. Where governments convey air rights, courts may become involved and prohibit disposal of publicly-owned rights without open competitive bidding.

Owners of air rights are liable for property taxes on these rights to the extent of their value. Almost all of the cases concerning valuation of air rights are inverse condemnation cases of which the state, by allowing aircraft to fly low over land, has been held to have "taken" the air rights above the land. The holding in these cases is usually that the value taken is the difference between the value of the original fee and the value once flights are in operation.

One case involving the listing and taxation of separated air rights is Macht v. Department of Assessments of Baltimore City, 266 Md. 206, 296 A.2d 162 (1972). In that case, the Court of Appeals of Maryland held that air rights created by long-term lease should be listed and taxed to the lessor, based on his income from such rights.

On the other hand, in Hartford Electric Light Company, supra, the court, citing Connecticut statutory law, held that where the air rights easements were recorded in the land records of the town where the land was located, and the lease provided that the lessee would pay all taxes, the

easements were to be separately listed and taxed in the name of the lessee.

4.2 MINERAL RIGHTS

In contrast to separated air rights, separated mineral rights have created a sizable amount of case law, as well as statutory law. Case law regarding separated mineral rights is remarkably consistent across the country.

Looking in detail at case law on separated mineral interests, it is generally accepted that mineral interests can be severed from the surface land either by a conveyance of those interests to someone other than the owner of the surface land, Rankin v. Mark, 238 Miss. 858, 120 So. 2d 435 (1960), or by a conveyance of the surface land with a reservation of the mineral rights, Ledoux v. Voorhees, 222 La. 200, 62 So. 2d 273 (1952). In most, if not all, states where separated mineral interests are recognized, a conveyance of mineral interests may be made, and the interests thus severed from the surface estate, by warranty deed, Humble Oil & Refining Co. v. State, 2 S.W.2d 559 (Tex. Cir. App. 1928); by quitclaim deed, Erwin v. Breese, 188 Okla. 391, 109 P.2d 507 (1940); by eminent domain, Trans-Oceanic Oil Corp. v. City of Santa Barbara, 85 Cal. App. 2d 776, 194 P.2d 148 (1948); and by will, Yoss v. Markley, 46 Ohio Abs. 217, 34 Ohio Op. 4, 68 N.E.2d 399 (1946). Severance may be possible by adverse possession in a few jurisdictions. See Broadhurst v. American Colloid Company, 85 S.D. 65, 177 N.W.2d 261 (1970), 35 A.L.R. 2d 124. There is disagreement in the courts as to whether judicial and administrative action not involving eminent domain can separate mineral rights. See, e.g., Ames v. Ames, 43 N.E. 592 (Ill. 1896); Griffith v. J.C. Miller Oil Company, 349 S.W.2d 833 (Ky. 1961); In re Delinquent Taxes, 81 Minn. 422, 84 N.W. 302 (1900); and Kanawha & Hocking Coal & Coke Co. v. Carbon County, 535 P.2d 1139 (Utah 1975).

Once severed, ownership of mineral interests can be conveyed by any means sufficient to sever such interests. Severed interests can be acquired by tax deed, Patterson v. May, 239 Iowa 602, 29 N.W.2d 547 (1947), or by intestate succession, Dorman v. Minnich, 336 S.W.2d 500 (Mo., 1960). Additionally, severed mineral interests can be acquired by adverse possession if there is actual taking of possession of the minerals. Kinder v. LaSalle County Carbon Coal Co., 301 Ill. 362, 133 N.E. 772 (1922). There are

contradictory court holdings concerning whether an adverse claimant can acquire severed mineral interests merely by possession of the surface estate. See, e.g., Claybrooke v. Barnes, 180 Ark. 678, 22 S.W.2d 390 (1929); Clements v. Texas Co., 273 S.W. 993 (Tex. Civ. App. 1925); Gill v. Fletcher, 74 Ohio St. 295, 78 N.E. 433 (1906); and Jenkins v. Frederick, 208 Okla. 583, 257 P.2d 1058 (1952).

It has been said that it is the recording of a deed to sever mineral rights that accomplishes the actual severance. Skelly Oil Co. v. Johnson, 209 Ark. 1107, 194 S.W.2d 425 (1946). Because mineral fee interests are real property, a conveyance of such interests is generally recorded with the chancery clerk, recorder, or other official in the county where the interests are located in order to notify third parties. Often, this must be done within a certain number of days after the conveyance. Hickey v. Dirks, 156 Kan. 326, 133 P.2d 107 (1943). Where leaseholds or royalty rights are considered realty, their creation and conveyance will also be recorded. Yttredahl v. Federal Farm Mortgage Corporation, 104 N.W.2d 705 (N.D. 1960). On the other hand, where leaseholds or royalty rights are considered personalty, they may need to be recorded in a separate set of files or they may not need to be recorded. See Riverview State Bank v. Ernest, 198 F.2d 876 (10th Cir., 1952).

Finally, with reference to the listing and taxing of mineral interests, separated mineral interests are generally listed and taxed separately. Huffman v. Henderson Co., 42 S.W.2d 221 (Ark., 1931). Oklahoma law provides an exception to the rule. See State v. Shamblin, 185 Okla. 126, 90 P.2d 1053 (1939).

The government cannot itself sever property for tax purposes where the mineral interests have not previously been separated. Humble Oil & Refining Co. v. Calvert, 478 S.W.2d 926 (Tex., 1972). Separated mineral estates are taxable to the owner of those estates, rather than the owner of the surface land. State ex rel. Svoboda v. Weiler, 205 Neb. 799, 290 N.W.2d 456 (1980). However, the total assessment of minerals and land in which the minerals are situated must be the value of the land increased by the value of the minerals. Big Creek Coal Co. v. Tanner, 303 Ill. 297, 135 N.E. 433 (1922).

In at least some states, leasehold interests under mineral leases are listed and taxed to the lessee. State v. Superior Court for Maricopa County, 113 Ariz. 248, 550 P.2d 626 (1976); Application of Dickey, 72 Ill. 2d 317, 21

Ill. Dec. 182, 381 N.E.2d 260 (1978). Royalty interests reserved by the owners of fee simple interests in minerals or the surface land may be assessed and taxed separately or merged in the fee. See Application of Dickey, supra; State v. Cummings, 206 Miss. 630 40 So. 2d 587 (1949). In some states, leaseholds are not taxed. Rist v. Toole County, 159 P.2d 340 (Mont., 1945).

Generally, market value is the test used in valuing mineral interests for tax purposes. State v. Federal Land Bank of Houston, 160 Tex. 282, 329 S.W.2d 847 (1959). However, the mineral ownership has sometimes been taxed at so much per acre of surface land or so much per interest per acre of surface land based on an amount fixed by statute, the theory being that the actual market value of such interests can often be determined only by prohibitively expensive exploration in the absence of sales data. Contos v. Herbst, 278 N.W.2d 732 (Minn., 1979). Scheduled dollar values per daily average barrel of oil produced have also been used for valuation of royalty rights. Application of Dickey, supra.

It has been said that in determining the market value of mineral interests, the expense of producing minerals must be considered, as well as the amount of the recoverable minerals, the time it will take to recover them, the producing history of the deposit and deposits in the vicinity, and sales prices of similar interests. Angle v. Board of County Commissioners of Rush County, 214 Kan. 708, 522 P.2d 347 (1974); Appeal of Barid, 334 Pa. 410, A.2d 306 (1939); Grant County Fiscal Court v. McGee, 582 S.W.2d 69 (Ky., 1979); Sun Oil Co. v. Fisher, 370 So. 2d 413 (Fla. Dist. Ct. of App., 1979).

It has also been held that in recording assessments against mineral rights, the close relationship between the surface and mineral rights makes it imperative that mineral listings be subjoined to the land assessments for reasons of owner identification and accuracy. Sorkin v. Myers, 216 Ark. 908, 227 S.W.2d 958 (Ark., 1950). The failure to record a severance of a mineral right or to list it for purposes of taxation has been held to be sufficient to void the acquisition of that right. Horville v. Lehigh Portland Cement Co., 105 Kan. 305, 182 P. 548 (1919).

4.3 WATER RIGHTS

As with subsurface space rights, there are few reported cases involving separated underground water rights. However, it is clear that water rights,

as a general rule, may be separated from the land to which they have been attached, and separately conveyed, Upper Harmony Ditch Co. v. Carwin, 189 Colo. 190, 539 P.2d 1282 (1975), subject only to the condition that the rights of other appropriators, if any, must not be injuriously affected, Johnston v. Little Horse Creek Irrigating Co., 13 Wyo. 208, 79 P. 22 (1904).

The manner in which the separation and conveyance of water rights can take place depends partly upon the legal nature of water rights in a particular jurisdiction, and that may depend upon statute, of course. In some states, it has been held that water rights separated from land do not provide ownership of water, but only the right to use water for various purposes. Johnston, supra. Where water rights are considered real estate, a warranty deed has been held sufficient to separate and convey water rights. Upper Harmony Ditch Company, supra. It has been held in some jurisdictions they are also acquirable by eminent domain, and they can be reserved in the granting away of other rights. See Laurence v. Kruckmeyer, 124 Ariz. 488, 605 P.2d 466 (1979); Thurston v. City of Portsmouth, 205 Va. 909, 140 S.E. 2d 678 (1965).

Relative to recording of water rights, it has been held that conveyed rights to percolating waters are not valid as against subsequent purchasers for valuable consideration without notice, unless they are acknowledged and recorded in the office of the county recorder. Neal v. Hunt, 112 Ariz. 307, 541 P.2d 559 (1975).

In one case, it was said that while riparian water rights are real property for some purposes, they are not taxed separately when not appurtenant to the riparian land. City of New York v. Schwartz, 36 App. Div. 2d 402, 320 N.Y.S.2d 983 (1971). On the other hand, courts in two California cases have construed statutes in that state to provide for taxation of water rights as a separate form of real property when severed from the land, County of Tuolumne v. State Board of Equalization, 206 Cal. App. 2d 352, 24 Cal. Rptr. 113 (1962); City & County of San Francisco v. Alameda County, 5 Cal. 2d 243, P.2d 462 (1936). Also, a New Hampshire court has reached the same result without a statute. Newmarket Mfg. Co. v. Town of Nottingham, 86 N.H. 321, 168 A. 892 (1933).

Generally, severed water rights are taxed through an increased assessment of the increased value benefited by the use of the water rights

and/or land that might be so benefited. In a few jurisdictions, water rights are not considered a taxable real property interest but are taxed as personalty.

4.4 DEVELOPMENT RIGHTS

The most celebrated court case dealing with development rights is Penn Central Transportation Co. v. City of New York, 438 U.S. 104 (1978), in which the Court upheld New York City's landmarks preservation law against charges of unconstitutional taking of private property without compensation. The Court stated that the New York law was not unconstitutional, partly because New York's recognition of transferable development rights in the hands of the owners of preserved property mitigated losses suffered by those owners, since the development rights could be transferred to other property, which could then be developed to a greater extent than would otherwise have been allowed by law.

Unfortunately, since the concept of separated development rights is relatively new, there are no other useful cases dealing with the separation and conveyance of development rights, or the recording, listing and taxation of such rights.

5. SUMMARY AND CONCLUSIONS

Separated rights in real estate are increasing in both number and complexity. This report is a preliminary effort to review the status of several kinds of separated rights, including air, mineral, water, and transferable development rights. Particular attention is given to the manner in which these rights are created, transferred, recorded, and assessed for taxation purposes.

This review of separated rights is based on a traditional review of published literature in the field, as well as an extensive review of relevant state statutes and case law.

It was not the objective of this study to make specific recommendations regarding separated property rights. However, the states may want to consider the potential impacts that the creation of large numbers of separated rights have in such areas as the pricing (valuing) and recording of these rights. One approach that has been used in similar complex situations is to work through the National Conference of Commissioners on Uniform State Laws. For example, this forum was used successfully in the preparation of the Uniform Land Transactions Act, prepared in 1977.^{45/} In addition to relevance to further work on separated rights, it is hoped this report will also be helpful in more general examinations of the status and consequences of the structure of land ownership in rural America.

^{45/} National Conference of Commissioners on Uniform State Laws, Uniform Land Transactions Act, 1977; Chicago, Illinois.

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Compiling a bibliography on the topic of separated property rights and valuation methods for them presents formidable obstacles. First, much of the literature on the topic appears in legal publications and law reviews. Since most of this literature is readily identifiable through periodical indexes and the catalogs of major law libraries, there is little point in attempting to identify it here. We have, therefore, excluded almost all of this material except for those items that were found to be most useful in the preparation of this report. Second, the valuation literature yields little on the topic, except that the subject of mineral rights valuation has been covered to some extent. Material on air rights valuation does exist, but the amount is small. The concept of development rights is comparatively new, and subsequently there is still little available information on development rights valuation. We have attempted to list what material does exist to our knowledge. It should be added that most state valuation manuals do not cover the appraisal of separated rights in any detail, nor are detailed statistics published on such either by the states or the federal government. Given the current state of land records in the United States, it is also not surprising that there are few statistics available on the ownership of separated rights, their extent, value, etc. Third, there is a great deal of information on extractive resource taxes, severance taxes, forest land taxation, water rights, and development rights as a land use regulation tool, but much of it is really rather tangential to the topic of this report. What follows then is a listing of materials used in the preparation of this report (excluding items cited in the body of the report) and other material relevant to the topic, given the parameters outlined above.

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APPENDIX A

LIST OF SIGNIFICANT AIR RIGHTS DEVELOPMENTS

Alabama

Birmingham

- Addition to University of Alabama Medical Center

California

Albany

- Warehouse under highway overpass

Sacramento

- Bank in space owned by Sacramento Re-development Authority over depressed street
- Office building over pedestrian mall

San Diego

- San Diego County Courthouse over street

San Francisco

- Alcoa-Golden Gateway Complex--a high-rise office building, a bank, and a restaurant over a municipally- owned three-story garage
- International Building, a high-rise office building, constructed over part of the city-owned St. Mary's Square parking garage
- The Matson-Standard Building, a ten-story building, over a gasoline service station
- Trans-Bay Bus Terminal over city streets

Sunnyvale

- Greyhound Bus Station under highway overpass

Connecticut

Hartford

- Hartford Public Library over street

District of Columbia

Washington

- L'Enfant Plaza over 9th Street Expressway
- South Portal Air Rights Building over I-95
- Subsidized housing over I-95
- U.S. Department of Labor Building over I-95

Illinois

Chicago

- Art Institute of Chicago over Illinois Central Gulf Railroad right-of-way
- Chicago Daily News Building, a twenty-five story structure over railroad right-of-way
- Chicago and Northwestern Railway Company
- Chicago Sun-Times newspaper over right-of-way
- Chicago Union Station
- Fulton street warehouses over J.F. Kennedy Expressway
- Gateway Office Building, a twenty-two story

- building, over a railroad right-of-way
 - Illinois Center, a fifty-two story hotel, office, and apartment complex on a thirty-three acre site of Illinois Central Gulf Railroad right-of-way
 - Marina Center, two forty-story apartment buildings, over a railroad right-of-way
 - Merchandise Mart, a nineteen story commercial building over the Chicago and Northwestern Railroad right-of-way
 - McCormick Inn, a hotel over Illinois Central Gulf Railroad right-of-way at 23rd street
 - Outer Drive East Apartments over Illinois Central Gulf Railroad right-of-way
 - Prudential Building, a forty-one story office building over Illinois Central Gulf Railroad right-of-way
 - U.S. Post Office over and under Eisenhower Expressway and above Chicago Union Station Company right-of-way
 - Five restaurants located over Illinois Tollway System
- Chicago area
- Indiana
Indianapolis
- Union Title Office Building over land owned by City Board of Works
- Iowa
Des Moines
- Department store over street
 - Gibbs Cook Tractor and Equipment Company over street
 - Northwestern Bell Telephone Company over street
- Kansas
Wichita
- Warehouse over Waterman street
 - First National Bank, a six-story office and bank building, over an alley
- Maryland
Bethesda
- Office building over a railroad right-of-way
- Massachusetts
Boston
- Prudential Center, a fifty-two story office, hotel, apartment, and auditorium complex, over the Massachusetts turnpike
- Cambridge
- Motel constructed in 1959 over parking facilities
- Fall River
- City hall parking over I-195

Newton	● Gateway Center over Massachusetts Turnpike
Newtonville	● Commercial structure, the Star Market, over Massachusetts Turnpike
<u>Michigan</u> Detroit	● Cobo Hall convention center over depressed section of John C. Lodge Freeway
<u>Nevada</u> Reno	● Holiday Inn Garage
<u>New York</u> Buffalo	● Erie County Library over street
Fresh Pond	● An automobile dealership over Long Island Railroad right-of-way
New York City	<ul style="list-style-type: none"> ● Apartment building over Franklin D. Roosevelt Drive ● CBS Building, a thirty-two story office building over a railroad right-of-way ● Concourse Village, seven high-rise apartment buildings on a ten acre site over the Mott Haven Railroad yards in the Bronx ● Madison Square Garden over railroad right-of-way ● New York City Municipal Building over a street ● New York Port Authority uptown bus terminal over east approach to George Washington Bridge ● New York Telephone Company Building, an office building, over railroad right-of-way ● Pan Am Building, a fifty-nine story office building over Conrail right-of-way ● Park Avenue development over Conrail (New York Central) right-of-way, which consists of at least eighteen structures, including the Waldorf-Astoria hotel ● Sutton Place Apartments over Franklin D. Roosevelt Drive ● United Nations Building over Franklin D. Roosevelt Drive ● United Nations Plaza, a forty-story office and apartment complex over highway ● Waldorf Astoria Hotel over railroad right-of-way ● George Washington Bridge Apartments, four thirty-two story buildings over the east approach to the George Washington Bridge ● Whitney Museum over street

- | | | |
|---------------------|--------------|--|
| <u>Ohio</u> | | |
| | Cincinnati | ● Lytle Park, over depressed section of Interstate 71 |
| | Cleveland | <ul style="list-style-type: none"> ● Cleveland Athletic Club over five-story mercantile building ● Sheraton Cleveland Hotel over railroad right-of-way ● The Cleveland Union Terminal development, including the Terminal Tower, an office building, the Sheraton Cleveland Hotel, and the Higbee department store over a railroad right-of-way |
| <u>Oklahoma</u> | | |
| | Tulsa area | ● Restaurant over Will Rogers Turnpike |
| <u>Pennsylvania</u> | | |
| | Philadelphia | ● Penn Center, an office, hotel, and apartment complex over Penn Central right-of-way |
| | Pittsburgh | ● Allegheny Shopping Center over public garage |
| <u>Rhode Island</u> | | |
| | Providence | ● Parking facility over street |
| <u>South Dakota</u> | | |
| | Sioux Falls | ● Parking facility over Big Sioux River |
| <u>Tennessee</u> | | |
| | | ● Baptist Sunday School Board office and operations building over Louisville and Nashville railroad property |
| <u>Texas</u> | | |
| | El Paso | ● El Paso National Bank Building and garage over Southern Pacific Railroad right-of-way |
| <u>Wisconsin</u> | | |
| | Milwaukee | ● County Courthouse Annex over U.S. 141 |
| <u>Washington</u> | | |
| | Renton | ● Public library over Cedar River |

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APPENDIX B

DISTRIBUTION AND VALUE OF MINERAL RESOURCES IN THE UNITED STATES

The following figures and tables, taken from U.S. Forest Service, An Assessment of the Forest and Range Land Situation in the United States (Washington, D.C.: U.S. Government Printing Office, 1980), provide information on the distribution and value of mineral resources in the United States.

Geographic Distribution of Metallic Minerals With Respect to Federally-Owned Lands

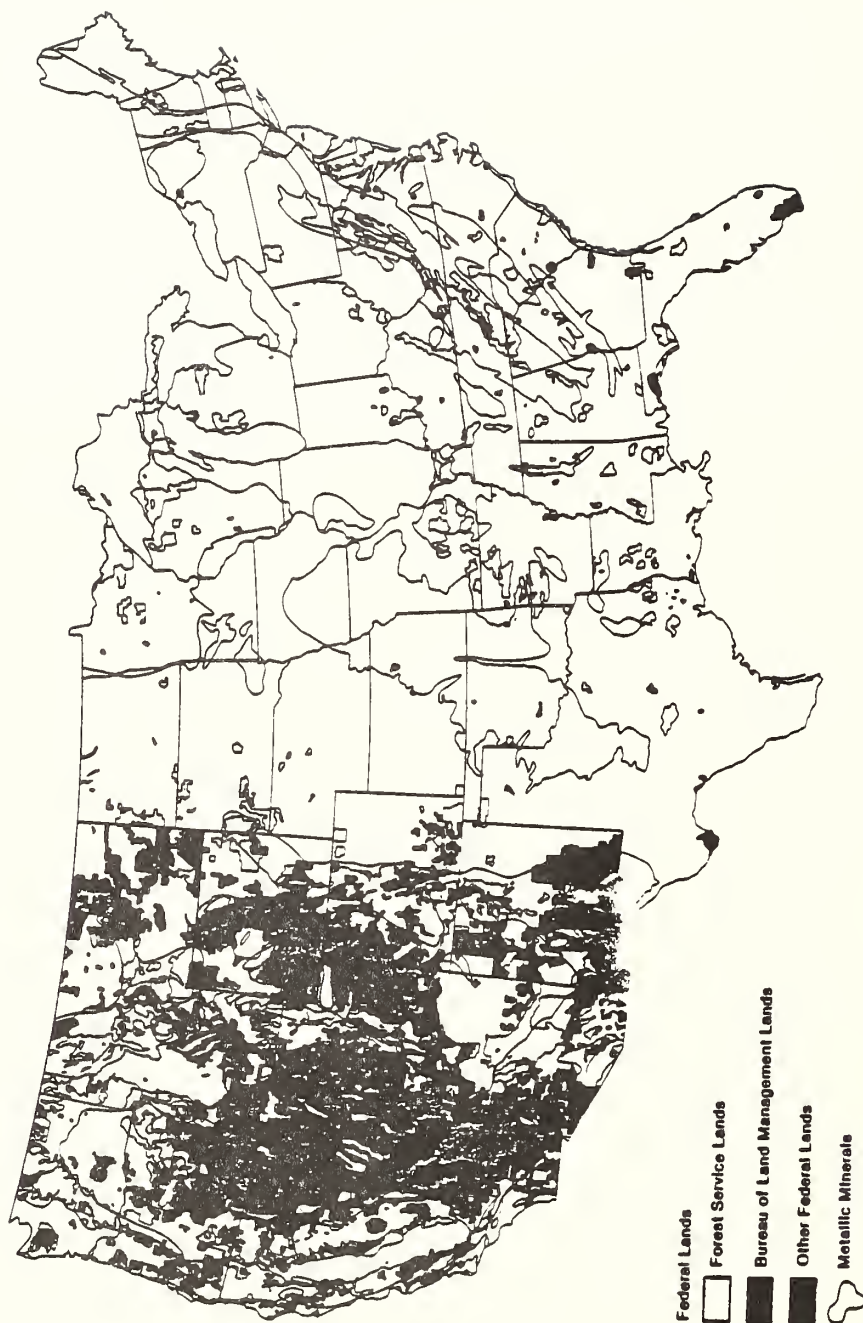


Table 2.10--Value of mineral production in the United States by section,
 section, and State, 1950, 1960, 1970 and 1975
 (Million dollars)

Section, region and State	1950		1960		1970		1975		Principal minerals, in order of value
	Current dollars	1967 dollars	Current dollars	1967 dollars	Current dollars	1967 dollars	Current dollars	1967 dollars	
North:									
Northeast:									
Connecticut	5.7	5.4	15.3	15.1	28.4	25.9	31.0	17.5	Stone, sand and gravel, feldspar, lime
Delaware	.5	.5	1.0	1.0	1.6	1.5	1.9	1.0	Sand and gravel, magnesium compounds, clays
Maine	22.7	7.2	13.6	13.4	23.8	21.7	36.7	19.5	Cement, sand and gravel, zinc, stone
Maryland	7.5	21.7	55.5	547.8	88.2	80.3	166.9	87.6	Coal, stone, cement, sand and gravel
Massachusetts	16.0	15.3	27.6	27.2	50.4	45.9	56.8	31.2	Stone, sand and gravel, lime, clays
New Hampshire	1.7	1.6	5.3	5.2	8.7	7.9	17.1	9.1	Stone, sand and gravel, stone, clays gem stone
New Jersey	46.4	44.3	56.4	55.6	89.3	81.3	123.7	65.7	Stone, sand and gravel, zinc, titanium concentrate
New York	156.5	169.5	256.7	251.2	299.6	272.9	397.7	211.2	Cement, stone, zinc, salt
Pennsylvania	1,186.2	1,133.0	826.5	813.1	1,095.7	997.9	2,907.8	1,546.2	Coal, cement, stone, lime
Rhode Island	1.4	1.3	5.7	5.6	4.4	6.2	6.2	3.3	Sand and gravel, stone, gem stones
Vermont	18.6	17.8	22.9	22.6	27.8	25.3	28.8	15.3	Stone, asbestos, sand and gravel, talc
West Virginia	87.6	79.4	720.7	710.7	1,285.4	1,170.7	3,390.2	1,800.4	Coal, natural gas, petroleum, natural gas liquids
Total	2,292.9	2,190.0	2,503.2	2,468.6	3,003.3	2,735.2	7,167.0	3,806.2	
North Central:									
Illinois	468.1	466.2	590.8	582.4	688.7	627.2	1,690.6	791.6	Coal, petroleum, stone, sand and gravel
Indiana	166.6	159.1	206.9	204.0	255.8	233.0	541.6	287.6	Coal, cement, stone, petroleum
Iowa	41.8	39.9	95.0	93.7	120.8	110.0	195.7	103.9	Cement, stone, sand and gravel, coal
Michigan	229.9	219.4	429.1	423.2	670.7	610.8	1,291.7	686.0	Iron ore, petroleum, cement, copper
Minnesota	331.6	316.7	515.3	508.2	633.0	576.5	1,097.1	582.6	Iron ore, sand and gravel, stone, cement
Missouri	113.2	108.1	156.0	153.8	393.0	357.9	722.7	303.8	Lead, cement, stone, iron ore
Ohio	274.6	262.3	389.8	384.4	612.2	557.6	1,156.5	720.4	Coal, petroleum, stone, lime
Wisconsin	41.7	39.8	77.2	76.1	87.7	79.9	132.3	70.5	Sand and gravel, stone, iron ore, cement
Total	1,687.4	1,611.7	2,460.0	2,426.0	3,461.9	3,152.9	6,828.1	3,626.2	
Total, North	3,980.3	3,801.6	4,963.2	4,894.7	6,465.1	5,888.1	13,995.1	7,432.3	
South:									
Southeast:									
Florida	67.7	64.7	176.9	174.5	300.0	273.2	1,775.5	942.9	Phosphate rock, petroleum, stone, cement
Georgia	46.2	42.2	91.2	89.9	203.2	183.1	331.4	172.1	Clays, stone, cement, sand and gravel
North Carolina	26.3	25.1	45.0	44.4	98.4	89.6	152.9	81.2	Stone, phosphate rock, lithium minerals, sand and gravel
South Carolina	11.4	10.9	30.0	29.6	56.4	51.4	115.5	61.3	Cement, stone, sand and gravel, clays
Virginia	137.8	131.6	203.8	201.0	374.3	340.9	1,262.0	670.2	Coal, stone, cement, sand and gravel
Total	287.4	274.5	546.9	539.3	1,032.3	940.2	3,639.2	1,932.7	
South Central:									
Alabama	159.0	151.9	217.6	214.6	323.2	294.4	969.0	514.6	Coal, petroleum, cement, stone
Arkansas	118.6	113.3	155.0	152.9	225.6	205.5	436.4	231.8	Petroleum, natural gas, stone
Kentucky	460.0	439.4	413.5	407.8	847.5	771.9	2,738.9	1,656.5	Coal, petroleum, stone, natural gas
Louisiana	693.6	662.5	1,967.7	1,940.5	5,102.3	4,646.9	8,513.3	4,521.1	Petroleum, natural gas, natural gas liquids, sulfur
Mississippi	102.9	98.3	19.9	19.6	250.0	227.7	410.0	217.7	Petroleum, natural gas, sand and gravel, cement
Oklahoma	527.1	503.4	779.1	768.3	1,137.3	1,035.8	2,267.1	1,204.0	Petroleum, natural gas, natural gas liquids, coal
Tennessee	89.7	85.7	163.4	161.4	220.5	200.8	426.0	225.6	Coal, stone, zinc, cement
Texas	2,674.0	2,554.0	6,136.9	6,077.0	6,402.5	5,631.1	15,329.9	8,247.4	Petroleum, natural gas, natural gas liquids, cement
Total	4,824.9	4,608.3	7,831.1	7,723.0	16,509.8	13,213.0	31,289.4	16,616.0	
Total, South	5,112.3	4,882.0	6,378.1	6,267.4	15,541.1	14,134.0	36,926.6	19,549.4	

Table 2.10--Value of mineral production in the United States by section, region, and State, 1950, 1960, 1970 and 1975--continued
(million dollars)

Section, region and State	1950		1960		1970		1975		Principal minerals, in order of value
	Current dollars	1967 dollars ^{1/}	Current dollars	1967 dollars ^{1/}	Current dollars	1967 dollars ^{1/}	Current dollars	1967 dollars ^{1/}	
Rocky Mountains and Great Plains:									
Rocky Mountains:									
Arizona	207.4	196.1	415.8	410.1	1,166.8	1,062.7	1,288.4	604.2	Copper, molybdenum, cements, sand and gravel
Colorado	154.9	147.9	342.2	337.5	389.8	355.0	960.8	510.2	Petroleum, molybdenum, coal, cement
Idaho	79.1	75.5	37.4	36.6	119.8	109.1	233.8	124.2	Phosphate rock, silver, zinc, lead
Montana	103.4	98.8	176.9	176.4	313.0	285.1	573.2	304.4	Petroleum, copper, coal, cement
Nevada	48.5	46.3	80.3	79.2	186.3	169.7	258.4	137.2	Copper, gold, sand and gravel, cement
New Mexico	210.3	200.9	632.2	643.2	1,060.4	965.8	2,091.5	1,110.7	Petroleum, natural gas, copper, potassium salts
Utah	230.0	219.7	431.4	425.4	602.0	548.3	966.4	513.2	Petroleum, copper, coal, gold
Wyoming	177.6	169.6	442.7	436.6	705.5	642.5	1,644.4	873.3	Petroleum, sodium compounds, coal, natural gas
Total, Rocky Mountains	1,211.2	1,156.8	2,600.9	2,585.0	4,543.6	4,136.2	8,016.9	4,237.4	
Great Plains:									
Kansas	368.6	352.1	486.0	467.3	586.2	533.9	970.6	515.5	Petroleum, natural gas, natural gas liquids, cement
Nebraska	16.0	15.4	103.7	102.5	72.7	66.2	111.9	59.4	Petroleum, cement, sand and gravel, stone
North Dakota	9.6	9.2	77.2	76.0	96.0	87.4	201.5	107.0	Petroleum, coal, sand and gravel, natural gas liquids
South Dakota	32.7	31.2	46.8	46.2	61.6	56.1	101.8	54.1	Gold, cement, stone, sand and gravel
Total, Great Plains	426.9	405.9	712.8	692.0	816.5	743.6	1,385.8	736.0	
Total, Rocky Mountains and Great Plains	1,638.1	1,562.7	3,313.6	3,268.0	5,360.0	4,881.7	9,402.8	4,993.4	
Pacific Coast:									
Pacific Northwest:									
Alaska	17.9	17.1	21.9	21.6	338.3	308.1	480.7	255.3	Petroleum, natural gas, stone, sand and gravel
Oregon	21.5	20.5	94.4	53.6	68.1	62.0	106.0	56.3	Stone, sand and gravel, cement, nickel
Washington	49.1	46.9	70.0	69.0	90.4	82.8	158.5	84.2	Cement, coal, sand and gravel, stone
Total	88.4	84.4	146.3	144.3	497.3	452.9	745.3	395.8	
Pacific Southwest:									
California	1,056.0	1,000.6	1,402.2	1,342.8	1,897.1	1,727.8	3,152.9	1,674.4	Petroleum, cement, natural gas, sand and gravel
Hawaii	1.0	1.7	9.3	9.2	29.0	26.4	49.7	26.4	Stone, cement, sand and gravel, pumice
Total	1,057.0	1,002.3	1,411.5	1,392.0	1,926.1	1,754.2	3,202.6	1,700.8	
Total, Pacific Coast	1,145.3	1,084.8	1,557.7	1,536.2	2,423.4	2,207.1	3,947.9	2,096.6	
Total, United States	11,874.9	11,341.8	18,212.6	17,981.1	29,789.7	27,130.9	62,274.3	33,071.9	

^{1/} Derived by dividing the value of minerals production in current dollars by the wholesale price index for crude materials for further processing.

Note: Columns may not add to totals because of rounding.

Source: Department of the Interior, Bureau of Mineral Yearbooks.

Geographic Distribution of Coal, Oil Shale, and Tar Sands With Respect to Federally Owned Lands

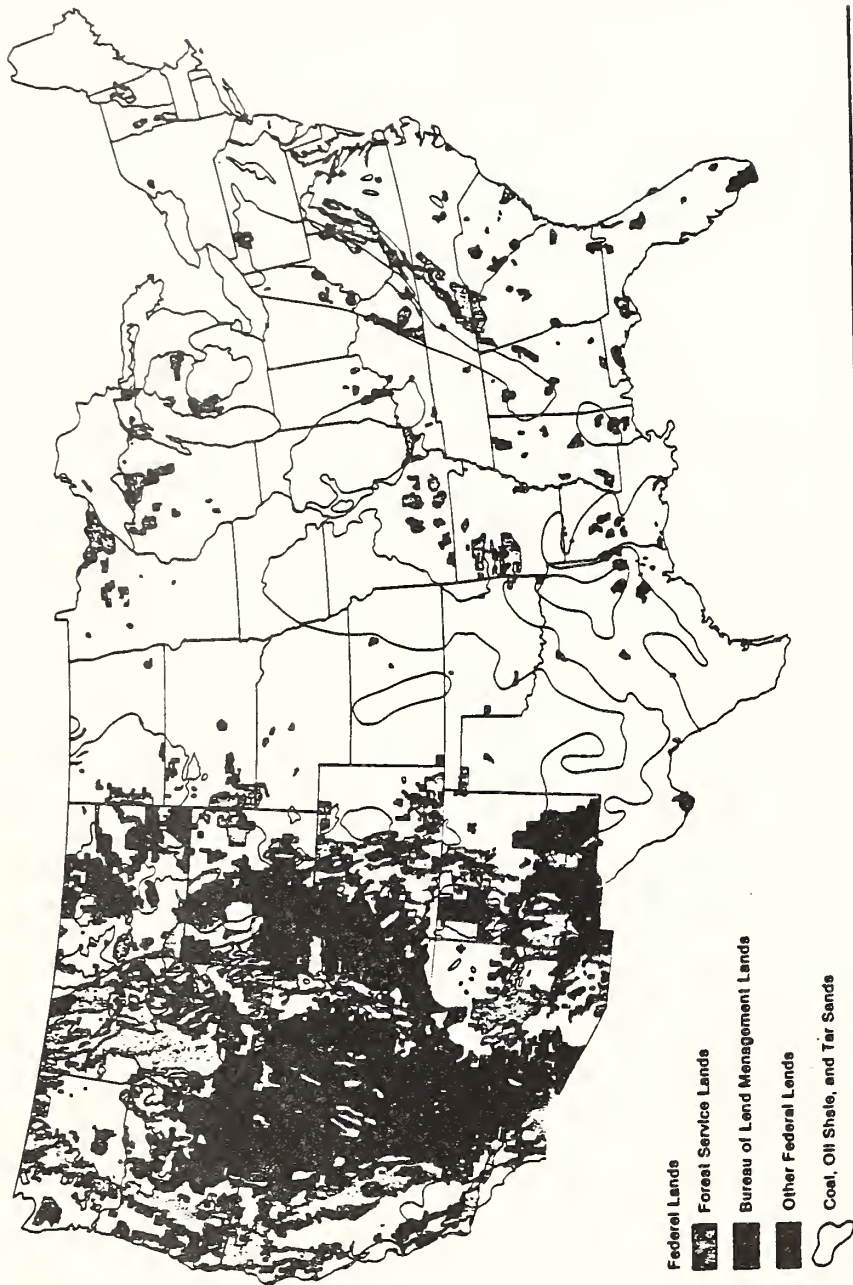


Table 2.13--Area^{1/} utilized for mining and area reclaimed in the United States
by class of mineral, section, region, and State, 1910-1971

Section, region, and State	Total				Nonmetal ^{2/}				Metals				Nonmetals			
	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed
North:																
Northeast:																
Connecticut	12.3	3.4	0.1	(³)	--	--	--	--	--	--	--	--	12.2	3.4	--	--
Delaware	1.3	.4	--	--	--	--	--	--	--	--	--	--	1.3	.4	--	--
Maine	10.6	3.2	.2	.1	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	10.4	3.1	--	--
Maryland	25.6	9.2	4.6	3.4	--	--	--	--	--	--	--	--	21.0	5.8	--	--
Massachusetts	20.3	5.6	--	--	--	--	--	--	--	--	--	--	20.3	5.6	--	--
New Hampshire	5.3	1.6	--	--	--	--	--	--	--	--	--	--	5.3	1.6	--	--
New Jersey	28.4	7.5	--	--	--	--	--	--	--	--	--	--	24.7	7.1	--	--
New York	96.3	24.6	(³)	.1	3.0	4.0	26.6	4.0	3.3	4.0	3.3	4.0	6.7	20.6	--	--
Pennsylvania	381.0	106.3	344.0	175.0	1.1	1.1	1.1	1.1	3.3	3.3	3.3	3.3	35.5	11.2	--	--
Rhode Island	2.3	.5	--	--	--	--	--	--	--	--	--	--	2.3	.5	--	--
Vermont	7.4	1.2	--	--	--	--	--	--	--	--	--	--	4.1	1.0	--	--
West Virginia	210.2	104.8	196.0	101.0	--	--	--	--	--	--	--	--	14.2	3.8	--	--
Total	800.7	348.2	545.6	279.5	34.1	4.7	34.1	4.7	221.0	64.1	221.0	64.1	61.6	17.9	17.9	17.9
North Central:																
Illinois	296.9	188.9	235.0	171.0	.3	--	--	--	--	--	--	--	61.6	12.0	--	--
Indiana	175.0	113.0	131.0	8.8	--	--	--	--	--	--	--	--	44.0	12.0	--	--
Iowa	55.3	18.3	3.1	6.3	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	85.9	22.9	--	--
Michigan	99.5	24.1	1.1	(³)	103.0	23.1	23.1	2.8	3.4	3.4	3.4	3.4	32.9	9.6	--	--
Minnesota	136.0	13.0	33.5	26.9	--	--	--	--	--	--	--	--	45.7	11.7	--	--
Missouri	102.3	41.4	207.0	157.0	--	--	--	--	--	--	--	--	84.6	24.2	--	--
Ohio	291.6	181.2	.1	(³)	2.3	139.2	6.7	11.3	666.7	186.6	666.7	186.6	44.5	12.2	--	--
Wisconsin	46.9	12.4	618.6	463.1	--	--	--	--	--	--	--	--	44.5	12.2	--	--
Total	1,203.5	592.3	1,164.2	742.6	173.3	11.3	173.3	11.3	666.7	186.6	666.7	186.6	44.5	12.2	12.2	12.2
Total, North																
South:																
Southeast:																
Florida	88.9	17.0	.7	(³)	10.4	1.9	1.9	1.9	77.7	15.1	77.7	15.1	33.3	9.4	--	--
Georgia	34.3	9.6	.1	--	.9	.2	.2	.2	35.2	9.5	35.2	9.5	14.4	4.1	--	--
North Carolina	36.6	9.6	--	(³)	1.4	(³)	1.4	(³)	4.1	9.5	4.1	9.5	4.1	9.5	--	--
South Carolina	14.6	4.1	.1	--	.1	--	--	--	4.1	9.5	4.1	9.5	4.1	9.5	--	--
Virginia	78.8	28.9	34.8	19.0	2.3	2.6	2.6	2.6	202.3	47.6	202.3	47.6	202.3	47.6	--	--
Total	253.1	69.3	35.7	19.1	15.1	2.6	15.1	2.6	202.3	47.6	202.3	47.6	202.3	47.6	47.6	47.6
South Central:																
Alabama	65.1	28.6	34.9	21.8	7.7	.3	.3	.3	22.5	6.4	22.5	6.4	22.5	6.4	--	--
Arkansas	29.5	9.0	3.1	2.1	3.7	.9	.9	.9	23.8	6.4	23.8	6.4	23.8	6.4	--	--
Kentucky	233.9	149.4	210.0	143.0	.1	(³)	(³)	(³)	18.2	5.2	18.2	5.2	18.2	5.2	--	--
Louisiana	18.2	5.2	--	--	--	--	--	--	10.7	3.3	10.7	3.3	10.7	3.3	--	--
Mississippi	10.7	3.3	--	--	--	--	--	--	20.8	5.3	20.8	5.3	20.8	5.3	--	--
Oklahoma	35.5	16.5	13.0	10.9	.9	.3	.3	.3	46.7	10.9	46.7	10.9	46.7	10.9	--	--
Tennessee	67.8	23.4	17.9	12.2	3.2	.4	.4	.4	72.7	19.6	72.7	19.6	72.7	19.6	--	--
Texas	78.0	20.5	.8	.5	4.5	.4	.4	.4	238.1	63.2	238.1	63.2	238.1	63.2	--	--
Total	538.6	256.0	280.5	190.5	20.0	2.3	20.0	2.3	440.4	110.8	440.4	110.8	440.4	110.8	110.8	110.8
Total, South	791.7	325.3	316.1	209.6	35.2	4.9	35.2	4.9	440.4	110.8	440.4	110.8	440.4	110.8	110.8	110.8

Table 2.13--Area^{1/} utilized for mining and area reclaimed in the United States
by class of mineral, section, region, and State, 1910-1971 --continued
(Thousand acres)

Section, region, and State	Total			Fossil fuels ^{2/}			Metals			Nonmetals		
	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed	Area utilized	Area reclaimed
Rocky Mountain and Great Plains:												
Rocky Mountain:												
Arizona	102.3	6.8	.2	.1	86.2	2.5	15.9		15.9		4.2	
Colorado	48.6	14.1	8.9	4.8	17.4	3.5	22.5		22.5		5.8	
Idaho	41.2	8.6	(3)	(3)	21.6	3.4	19.6		19.6		5.2	
Montana	42.8	10.6	6.9	3.7	15.7	1.2	20.2		20.2		5.7	
Nevada	41.2	4.1	--	--	29.1	1.6	12.1		12.1		2.5	
New Mexico	47.6	9.8	8.6	6.0	21.8	.8	17.4		17.4		3.0	
Utah	66.7	6.3	3.2	3.2	48.9	2.1	14.6		14.6		3.9	
Wyoming	28.4	9.0	10.1	4.8	5.8	.4	12.5		12.5		3.8	
Total, Rocky Mountain	419.2	69.3	37.9	19.7	246.5	15.5	134.8		134.8		34.1	
Great Plains:												
Kansas	44.0	21.5	19.7	15.7	6.1	.5	18.2		18.2		5.3	
Nebraska	12.8	3.7	--	--	--	--	12.8		12.8		3.7	
North Dakota	35.1	23.9	27.3	21.6	(3)	(3)	7.8		7.8		2.3	
South Dakota	16.5	4.6	.3	.2	1.4	.1	14.8		14.8		4.3	
Total, Great Plains	108.4	53.7	47.3	37.5	7.5	.6	53.6		53.6		15.6	
Total, Rocky Mountain and Great Plains:	527.6	123.0	85.2	57.2	254.0	16.1	188.4		188.4		49.7	
Pacific Coast:												
Pacific Northwest:												
Alaska	29.6	10.7	3.6	3.3	16.1	4.4	9.9		9.9		3.0	
Oregon	34.0	8.9	(3)	(3)	5.5	1.3	28.5		28.5		7.7	
Washington	35.9	9.7	2.0	.6	1.4	.1	32.6		32.6		9.0	
Total	99.6	29.3	5.6	3.9	23.0	5.8	71.0		71.0		19.7	
Pacific Southwest:												
California	226.5	43.9	.5	.1	38.0	5.3	188.0		188.0		38.5	
Hawaii	4.8	1.2	--	--	--	--	4.8		4.8		1.2	
Total	231.3	45.1	.5	.1	38.0	5.3	192.8		192.8		39.7	
Total, Pacific Coast	330.9	74.4	6.1	4.0	61.0	11.1	263.8		263.8		59.3	
Total, United States	3,654.3	1,463.2	1,571.6	1,031.6	523.4	43.3	1,559.3		1,559.3		406.3	

^{1/}Includes surface mine excavation area used for disposal of surface mine waste, surface area subside of disturbed as a result of underground workings, surface area used for disposal of underground waste, and surface area used for disposal of mill or processing waste.

^{2/}Excludes oil and gas operations.

^{3/}Less than 50,000 acres.

Note: Columns may not add to totals because of rounding.

Source: Department of Interior, Bureau of Mines Information Circular 8642 and unpublished data.

APPENDIX C
TABLE OF STATUTES

The following is a listing of specific state statutes that deal with the conveyance, recordation, and assessment of separated rights. It must be noted that searches of state statutes cannot be considered truly comprehensive or even completely accurate, due to the rather poor subject indexing of many statutory compilations and the inevitable human error involved. Computer-assisted searching of such compilations is available for only three states. Therefore, this list cannot be considered complete, but it will at least provide a starting point for persons interested in this area. Unless otherwise indicated, the citations are to the statutes that generally regulate conveyances and recordation.

ALABAMA

Ala. Code.

tit. 35 § 4-51

tit. 40 § 7-15 & 11-1 (separate assessment of separated rights)

ALASKA

Alaska Stat.

§ 34.15.010; 34.15.350

§ 29.53.030 (assessment of certain mining claims and surface areas)

ARIZONA

Ariz. Rev. Stat.

§ 33-401; 33-411

ARKANSAS

Ark. Stat. Ann.

§ 16-101; 50-427

§ 50-1203 (recordation of preservation restrictions)

§ 84-203 (separate assessment of mineral and timber rights)

§ 84-204 (separated timber rights treated as personalty)

CALIFORNIA

Cal. Civil Code

§ 1044; 1169 (West)

Cal. Government Code

§ 27280 (West)

CALIFORNIA, continued

Cal. Revenue and Taxation Code

§ 104 (West) (real property includes separated rights)

Cal. Water Code

§ 102 (West) (state owns all water, but right of use may be appropriated in the manner prescribed)

COLORADO

Colo. Rev. Stat.

§ 38-32-101 et seq.; 38-20-102; 38-35-709; 38-35-121

§ 38-32.5-101 (conveyance and recordation of solar easements)

§ 38-30.5-101 et seq. (recordation of conservation easements)

§ 39-1-104; 39-6-106; 39-6-111 (assessment of mineral rights)

CONNECTICUT

Conn. Gen. Stat. Ann.

§ 47-5; 47-10; 47-12a (West)

§ 12-64 (West) (separate assessment of air space)

DELAWARE

Del. Code Ann.

tit. 25 § 154 (Michie)

tit. 7 § 6811 (Michie) (recordation of preservation and conservation easements)

FLORIDA

Fla. Stat. Ann.

§ 689.01; 695.01; 695.02 (West)

§ 689.20 (West) (use of word "minerals" in deeds does not include topsoil, muck, peat, humus, sand, and common clay unless expressly provided)

§ 704.07 (West) (recordation of solar easements)

§ 193.481 (West) (separate assessment of subsurface rights)

§ 193.501 (West) (recordation of development rights)

GEORGIA

Ga. Code Ann.

§ 29-301; 29-401; 29-427

§ 85-1407 et seq. (recordation of facade and conservation easements)

§ 91A-1002 (interests less than fee taxable as real property)

HAWAII

Haw. Rev. Stat.

§ 501-103; 502-81; 502-31

IDAHO

Idaho Code Ann.

- § 55-604; 9-503; 55-801
- § 55-615 (conveyance and recordation of solar easements)
- § 63-2801 (mineral rights reserved to grantor must be assessed at no less than \$5.00 per acre of mineral rights so reserved)
- § 42-230 ("water right" is the right to use water for beneficial purposes)
- § 42-201 (water is property of the state and the right to use water is not a property right, "but such right shall become the complement of, or one of the appurtenances of, the land or other thing, to which, through necessity, said water is being applied...")

ILLINOIS

Ill. Ann. Stat.

- ch. 30 § 1 et seq.
- ch. 96½ § 156; 157 (conveyance and recordation of mineral rights)
- ch. 120 § 501 (real property on which there is a coal or other mine... is valued at 33 1/3 percent of fair cash value)
- ch. 30 § 401 et seq. (recordation and conveyance of conservation easements)

INDIANA

Ind. Code Ann.

- § 32-1-2-16 (Burns)
- § 32-5-2.5-2 (solar easements subject to recordation requirements)
- § 32-5-11-4 (mineral rights are recorded by county recorder)
- § 6-1-20-4 (estates in land distinct from ownership of surface are real property for tax purposes; mineral interests are specifically noted)

IOWA

Iowa Code Ann.

- § 427A.1 (West) (land and water rights, subsurface rights, and air rights are real property for tax purposes)
- § 111D.2 (West) (conservation easements recordation)
- § 558.1; 558.41 (West)

KANSAS

Kan. Stat. Ann.

- § 58-2221; 58-2205
- § 58-3801 et seq. (conveyance and recordation of solar easements)
- § 79-420 (separate assessment and taxation of mineral rights)

KENTUCKY

Ky. Rev. Stat. Ann.

- § 381.430 (ownership of mineral and surface rights)
- § 381.060; 382.010; 382.110

LOUISIANA

La. Rev. Stat. Ann.

§ 9:2721; 44:103 (West)

MARYLAND

Md. Real Prop. Code Ann.

§ 3-101 et seq.

§ 2-118 (recordation of conservation easements)

Md. Ann. Code art. 81

§ 19(a)(3) (separate assessment of surface and mineral rights when separated)

MASSACHUSETTS

Mass. Ann. Laws

ch. 183 §15 (Law Co-op)

ch. 185 § 47; 55 (Law Co-op)

ch. 60 § 22A (Law Co-op) (separate tax bills to persons owning interests in one parcel)

MAINE

Me. Rev. Stat. Ann.

tit. 33 § 201 (West)

tit. 33 § 667 (West) (conservation easements are recorded)

tit. 36 § 551 (West) (separated interests are real estate?)

MICHIGAN

Mich. Comp. Laws Ann.

§ 211.6a (separate assessment of mineral rights separately owned)

§ 211.6b (exclusions from the above)

§ 211.53 (state geologist values separated mineral rights, not local assessor)

§ 554.705(8); 554.713(3) (recordation of development rights for agricultural and open space lands)

MINNESOTA

Minn. Stat. Ann.

§ 507.24; 507.36 (West)

§ 272.04 (West) (separate assessment of separated rights, specifically, minerals, oil, coal, gas, and air space)

§ 500.30 (conveyance and recordation of solar easements)

MISSISSIPPI

Miss. Code Ann.

§ 89-1-1; 89-5-1

§ 27-35-51 (separated interests separately assessed and taxed as real estate)

MISSOURI

Mo. Ann. Stat.

- § 442.020; 442.380 (Vernon)
- § 442.012 (Vernon) (conveyance and recordation of solar easements)
- § 259.220 (Vernon) (separated mineral rights separately assessed and taxed as real estate)

MONTANA

Mont. Code Ann.

- § 70-21-201; 70-21-208
- § 70-17-101 (conservation, light, and right of taking water, wood, minerals and other things are defined as easements which may be attached to land as incidents or appurtenances)
- § 70-15-101 (real property is land and that which is incidental or appurtenant to land)
- § 15-6-131 (mineral rights are assessed and taxed as real property)

NEBRASKA

Neb. Rev. Stat.

- § 76-211; 76-237
- § 77-103 (mines and minerals included in definition of real property subject to taxation)

NEVADA

Nev. Rev. Stat.

- § 111.105; 111.315
- § 111.370 (conveyance and recordation of solar easements)

NEW HAMPSHIRE

N.H. Rev. Stat. Ann.

- § 447.3-a; 477.26
- § 477:47 (conveyance and recordation of conservation, and preservation and agricultural restrictions)
- § 72:13; 75:2 (separate taxation of separated interests)
- § 48-B:1 (buildings on air rights leased from public agencies are taxable, but land is not)

NEW JERSEY

N.J. Stat. Ann.

- § 46:16-2 (West)
- § 46:3-19 et seq. (West) (air rights may be separately owned from the land below and are considered an interest in the land)
- § 46:3-25 (West) (conveyance and recordation of solar easements)
- § 13:8-29 et seq.; 13:8-45 et seq. (West) (scenic easements)
- § 13:8B-1 et seq. (West) (conveyance and recordation of conservation and historic preservation restrictions)
- § 4:1B-11 (West) (conveyance and recordation of development rights to agricultural land)

NEW MEXICO

N.M. Stat. Ann.

- § 14-9-1; 47-1-34
- § 47-1-4 (rights in real estate may be conveyed)
- § 7-36-22 (definitions of mineral interests for assessment and taxation purposes, except oil and gas)

NEW YORK

N.Y. Real Prop. Law

- § 291 (McKinney)

NORTH CAROLINA

N.C. Gen. Stat.

- § 39-1; 47-18; 161-14
- § 47-27 (easements may be recorded)
- § 46-4 (partitions of mineral and surface rights are distinct)
- § 105-274 (rights to real estate are real property for tax purposes)

NORTH DAKOTA

N.D. Cent. Code

- § 47-09-02; 47-19-01; 47-19-07; 47-19-42
- § 47-10-24; 47-10-25 (conveyance of mineral rights must be specific)
- § 57-02-04 (rights in property are real property for tax purposes)

OHIO

Ohio Rev. Code Ann.

- § 5302.04; 5301.25 (Page)
- § 1302.03 (Page) (severance of mineral or timber is a contract for sale that may be recorded as other land transfers)

OKLAHOMA

Okla. Stat. Ann.

- tit. 16 § 29 (West)
- tit. 68 § 2419 (West) (rights in property are real property for tax purposes)

OREGON

Or. Rev. Stat.

- 93.020
- 517.090 (conveyances of mining claims or interests therein subject to recordation requirements for transfers and mortgages of other real property)
- 93.710 (recordation of mineral rights)
- 308.115 (severed interests in real property are assessed and taxed as real or personal property in accordance with existing law)
- 307.101 (water, timber, and mineral rights are real property)

PENNSYLVANIA

Pa. Stat. Ann.

tit. 21 § 3 (Purdon)

tit. 68 § 801 et seq. (Purdon) (conveyance, recordation, and assessment and taxation of air rights)

RHODE ISLAND

R.I. Gen. Laws

§ 34-11-30; 34-13-1

§ 34-39-4 (conservation and preservation restrictions are considered interests in real estate and must be conveyed and recorded according to the general laws relating to execution and recording)

SOUTH CAROLINA

S.C. Code

§ 30-7-10; 30-9-10

§ 27-9-10 et seq. (conservation easements are recorded in the same manner as conveyances of interests in land)

§ 12-37-630 (when surface and mineral rights are separate, proceeds of minerals are taxed as personal property)

§ 12-37-1340 (when land is mined, the land is not taxed; gross proceeds of mine are taxable)

SOUTH DAKOTA

S.D. Compiled Laws Ann.

§ 43-28-1

TENNESSEE

Tenn. Code Ann.

§ 64-501; 64-504

§ 67-601 (property rights are real property for tax purposes)

TEXAS

Tex. Stat. Ann.

art. 1291; 6591; 6626 (Vernon)

art. 7146 (Vernon) (property rights are taxable as real property)

UTAH

Utah Code Ann.

§ 57-1-1; 57-1-3; 57-3-1

§ 59-3-1 (property rights are real estate for tax purposes)

VERMONT

Vt. Stat. Ann.

tit. 27 § 301; 308; 341

VIRGINIA

Va. Code

- § 55-6; 55-106
- § 55-774 (separate assessment of separated mineral rights)

WASHINGTON

Wash. Rev. Code Ann.

- § 64.04.010; 65.08.070
- § 84.04.090 (property rights are real property for tax purposes)
- § 78.08.031 (repealed by ch. 30, sec. 20, 1979 1st Ex. Session; provided that mining districts could elect a recorder to record mining claims)

WEST VIRGINIA

W.Va. Code

- § 36-1-1; 39-1-2
- § 11-4-9 (severed mineral or timber interests are separately assessed and taxed; ownership of such interests must be entered in county land books)

WISCONSIN

Wis. Stat. Ann.

- § 706.05 (West)
- § 840.01 (West) (defines interest in real property)
- § 706.055 (West) (register of deeds records all conveyances of mineral interests in a register of mineral rights)
- § 70.03 (West) (property rights are real property for tax purposes)

WYOMING

Wyo. Stat. Ann.

- § 34-1-102; 34-1-119
- § 39-1-101 (real property defined as land and appurtenances)
- § 41-3-101 et seq. (water rights)

APPENDIX D
TABLE OF CASES

Alabama

Nelson v. Teal, 293 Ala. 173, 301 So. 2d 51 (1974) (Mineral Rights)
Sanford v. Alabama Power Co., 256 Ala. 280, 54 So. 2d 562 (1951) (Mineral Rights)

Arizona

Arizona State Real Estate Dept. v. American Standard Gas & Oil Leasing Service, Inc., 119 Ariz. 183, 580 P.2d 15 (1978) (Mineral Rights)
Laurence v. Kruckmayer, 124 Ariz. 488, 605 P.2d 466 (1979) (Water Rights)
Neal v. Hunt, 112 Ariz. 307, 541 P.2d 559 (1975) (Water Rights)
State v. Superior Court for Maricopa County, 113 Ariz. 248, 550 p.2d 626 (1976) (Mineral Rights)

Arkansas

Arrington v. United Royalty Co., 188 Ark. 270, 65 S.W.2d 36 (1933) (Mineral Rights)
Brizzolara v. Powell, 214 Ark. 870, 218 S.W.2d 728 (1949) (Mineral Rights)
Claybrooke v. Barnes, 180 Ark. 678, 22 S.W.2d 390 (1929) (Mineral Rights)
Garvan v. Kimsey, 239 Ark. 295, 389 S.W.2d 870 (1965) (Mineral Rights)
Huffman v. Henderson Co., 42 S.W.2d 221 (1931) (Mineral Rights)
Loney v. Monsanto, 233 Ark. 645, 348 S.W.2d 826 (1961) (Mineral Rights)
Skelly Oil Co. v. Johnson, 209 Ark. 1107, 194 S.W.2d 425 (1946)
Sorkin v. Myers, 216 Ark. 908, 227 S.W.2d 958 (1950) (Mineral Rights)
Wynn v. Sklar & Phillips Oil Company, 254 Ark. 332, 493 S.W.2d 439 (1973) (Mineral Rights)

California

Atlantic Oil Co. v. Los Angeles County, 69 Cal.2d 585, 72 Cal. Rptr. 886, 446 P.2d 1006 (1968) (Mineral Rights)
Callahan v. Martin, 3 Cal.2d 110, 43 P.2d 788 (1935) (Mineral Rights)
Carlsbad Mutual Water Co. v. San Luis Ray Development Co., 78 Cal. App.2d 900, 178 P.2d 844 (1947) (Mineral Rights)
City of Los Angeles v. City of San Fernando, 14 Cal. 2d 199, 123 Cal. Rptr. 1, 537 P.2d 1250 (1975) (Water Rights)
City & County of San Francisco v. Alameda County, 5 Cal. 2d 243, 54 P.2d 462 (1936) (Water Rights)
County of Tuolumne v. State Board of Equalization, 206 Cal. App.2d 352, 24 Cal. Rptr. 113 (1962) (Water Rights)
Dabney-Johnson Oil Corporation v. Walden, 4 Cal. 2d 637, 52 P.2d 237 (1935) (Mineral Rights)
Gerhard v. Stephens, 68 Cal. 2d 864, 69 Cal. Rptr. 612, 442 P.2d 692 (1968) (Mineral Rights)
Gould v. Stafford, 91 Cal. 146, 27 P. 543 (1891) (Water Rights)
La Laguna Ranch Co. v. Dodge, 18 Cal. 2d 132, 114 P.2d 351 (1941) (Mineral Rights)

California, continued

Trans-Oceanic Oil Corp. v. City of Santa Barbara, 85 Cal. App. 2d 776, 194 P.2d 148 (1948) (Mineral Rights)
Wright v. Best, 19 Cal.2d 368, 121 P.2d 702 (1942) (Water Rights)

Colorado

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